Assessing the British Carrier Debate and the Role of Maritime Strategy

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Abstract

This thesis explores the connection between seapower, maritime strategy and national policy, and assesses the utility of a potential Maritime Strategy for Britain. Underpinning the analysis, and providing the skein of connecting thought throughout the thesis, is the question: what is the strategic utility of maritime forces? Specifically, the thesis first examines the development of maritime theory and its translation into practice within the context of contemporary British maritime thinking and doctrine. In order to do this, the thesis examines the development of the British maritime school of thought, focusing on its leading figures and core tenets and the extent to which such thinking is reflected in contemporary doctrine. The thesis proceeds to examine, as a case study, the debate on the rationale for, and design, development and procurement of, Britain's future aircraft carrier capability in order to shed light on British thinking on the role and utility of maritime strategy. The analysis especially considers the debate on the configuration of aircraft carrier to be developed and the commensurate variant of aircraft to be acquired (that is, principally short take-off and vertical landing or catapult-assisted take-off but arrested recovery). This debate extends beyond a consideration of naval factors and considers wider military and national policy (notably military-industrial) factors. Proceeding from this, the thesis examines potential alternatives to a traditionally conceived aircraft carrier, including missile-armed surface and sub-surface naval forces and land-based aviation. The purpose of this is to shed further light on the utility of aircraft carriers relative to other options and assess their value to British maritime strategy and national policy. The thesis concludes with an assessment of the implications of the aircraft carrier debate for British defence and national policy and examines the rationale for, and implications of a Maritime Strategy for Britain.

Contents

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Introduction

Research Concept

This thesis examines the connection between seapower, maritime strategy and national policy, and assesses the utility of a maritime strategy for Britain. Underpinning the analysis, and providing the skein of connecting thought throughout the thesis, is the question: what is the strategic utility of maritime forces? Specifically, the thesis first examines the development of maritime theory and its translation into practice within the context of contemporary British maritime thinking and doctrine. In order to do this, the thesis examines the development of the British maritime school of thought, focusing on its leading figures and core tenets and the extent to which such thinking is reflected in contemporary doctrine. The thesis proceeds to examine, as a case study, the debate on the rationale for, and design, development and procurement of, Britain's future aircraft carrier capability in order to shed light on British thinking on the role and utility of maritime strategy. This debate extends beyond a consideration of naval factors and considers wider military and national policy (notably military-industrial) factors. Proceeding from this, the thesis examines potential alternatives to a traditionally conceived aircraft carrier, including missile-armed surface and sub-surface naval forces and land-based aviation, in order evaluate the utility of aircraft carriers relative to other options and assess their value to British maritime strategy and national policy. The thesis concludes with an assessment of the implications of the aircraft carrier debate for British defence and national policy and examines the rationale for, and implications of a Maritime Strategy for Britain.

The central question for the thesis is: What light does the debate on the development and procurement of the future aircraft carriers shed on contemporary British thinking on the nature and utility of maritime strategy? This question provides the central aim of the thesis. That is, to evaluate the debate on the design, development and procurement of the future aircraft carriers within the context of a discussion of contemporary British maritime thinking and doctrine, in order to assess the nature and utility of British maritime strategy. The future aircraft carrier

programme is one of the Ministry of Defence's principal investment projects and thus provides a significant case study for the examination of what Britain views as the primary roles for maritime power; how maritime power can be utilised; and why maritime power is valuable both in a defence and wider grand strategic setting.

In order to answer the central question, the thesis examines the following secondary questions: How does the debate in the literature on the nature of seapower and maritime strategy shed light on the utility of maritime forces? What is the connection between seapower, maritime strategy and national policy? What was the rationale for developing the future aircraft carriers? What need are they seen as meeting? Has this remained consistent or has it changed in response to evolving strategic circumstances? What was the debate concerning the procurement of (a) any aircraft carriers, (b) aircraft carriers of this specific design? What was the case for and against? What alternatives were considered? What alternatives could or should have been considered? Finally, what options / variations of maritime strategy are possible? How do they reflect British maritime thinking and thinking on, and options for, national policy?

Research Method and Design

The research is principally based on secondary literature and interviews with key individuals. The secondary literature is subject to a qualitative content analysis and thematic analysis for its review. This approach focuses on the analysis and interpretation of key concepts and themes in the surveyed literature.[1] This literature covers three strands; the first relating to maritime strategy, seapower and national policy; the second, contemporary British maritime thinking and doctrine; and the third, the debate on the future aircraft carriers.

The first strand of literature is analysed using a deductive approach (analysing the meanings of concepts and theories) as the first stage of the research to establish a conceptual framework for the thesis (see below). Sir Julian Corbett explained the importance of theoretical study in the following terms:

[1] 'Online QDA - Glossary', http://onlineqda.hud.ac.uk/glossary.php/. Accessed 22 September 2013.

> That the factors are infinitely varied and difficult to determine is true, but that, it must be remembered, is just what emphasises the necessity of reaching such firm standpoints as are attainable. The vaguer the problem to be solved, the more resolute must we be in seeking points of departure from which we can begin to lay a course, keeping always an eye open for the accidents that will beset us, and being always alive to their deflecting influences. And this is just what the theoretical study of strategy can do. It can at least determine the normal. By careful collation of past events it becomes clear that certain lines of conduct tend normally to produce certain effects; that wars tend to take certain forms each with a marked idiosyncrasy; that these forms are normally related to the object of the war and to its value to one or both belligerents; that a system of operations which suits one form may not be that best suited to another.[2]

The second strand is analysed within this framework, using a historiographical approach (that is, '... the scrutiny of the purveyors of historical knowledge, of the processes by which one comes to understand historical events, rather than the events themselves')[3] and inductive analysis (historical and or comparative analysis), to examine how and why British maritime thinking and doctrine has developed. This also involves the analysis of primary sources, including Government policy documents and doctrinal and conceptual publications (see 'Literature Overview'). The purpose of this is to identify key themes and trends in British defence, and specifically maritime, thinking and policy. It must be noted that specific aspects of the decision-making process concerning the formulation of naval and wider defence policy, and the development of the future aircraft carriers are not available due to security classification. This is not however an impediment to the research the focus of which is conceptual and at the strategic level. The thesis is for the most part concerned with the general trajectory of thinking, rather than detailed insight into the specifics of technical detail. An extensive series of interviews with academics, serving and retired senior officers (including former Service Chiefs), civil servants and industrial officials closely involved in this process and the future aircraft carrier programme form part of this, and the following stage of the research. A semi-structured approach to interviews is utilised in order to enable key themes to be discussed but for the specifics of the discussion to be free-ranging and maximise the input from each contributor.

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[2] Sir Julian Corbett, *Some Principles of Maritime Strategy* (reprinted with 'Introduction' by Eric Grove (Annapolis, MD: Naval Institute Press, 1988)), pp.8-9.
[3] Oliver J. Daddow, 'British Military Doctrine in the 1980s and 1990s', *Defence Studies*, Vol.3, No.3 (Autumn 2003), pp.103-113, quotation, p.104.

The third strand of literature serves as the case study for the thesis. It builds upon the previous two sections of research by providing a specific context within which to examine the application of the theoretical and doctrinal concepts that form the basis of British maritime thinking. It also considers the implications of the latter for British national policy, and considers the nature and utility of a notional maritime strategy. This strand principally draws upon British sources but also examines literature concerning foreign thinking on maritime airpower. This for the most part, draws upon US experience. Although the US may operate on a different, and much larger scale than that the UK aspires to, its experience is relevant for three reasons: first, the US utilises both main approaches to maritime aviation that Britain has considered (short take-off and vertical landing vis-à-vis catapult-assisted take-off but arrested recovery); second, the UK seeks to maximise interoperability with the US Armed Forces, including the Navy and Marine Corps and thus, US thinking on maritime air operations is directly relevant to British developments; third, the aircraft that the UK is acquiring to operate from the future aircraft carriers is under development as part of a US-led programme to develop a common aircraft, spanning three variants, for primarily the US Air Force, Navy and Marine Corps. This strand of literature also draws significantly upon the outputs of official auditing bodies, namely the House of Commons Defence Committee and National Audit Office in the UK and the US Department of Defense.

The thesis focuses on two overarching themes: the strategic utility of maritime forces and the relationship between national policy and seapower. The latter has formed a significant component of the discourse on maritime strategy; for example, being addressed by authors including Sir Julian Corbett,[4] Admiral Sir Herbert Richmond,[5] Admiral Sergei Gorshkov,[6] Vice Admiral Sir Peter Gretton,[7] and Professor Geoffrey Till.[8] The former is a concept that the thesis seeks to examine and develop as a means of providing a conceptual framework within

[4] Corbett, *Some Principles*.
[5] Sir Herbert Richmond, *National Policy and Naval Strength and Other Essays* (Modern Revivals in Military History), (Aldershot: Gregg Revivals, 1993) [new edition of 1928 original].
[6] Sergei Gorshkov, *The Sea Power of the State* (Oxford: Pergamon Press Ltd, 1979).
[7] Vice Admiral Sir Peter Gretton, *Maritime Strategy: A Study of British Defence Problems* (London: Cassell, 1965).
[8] Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Second Edition (Abingdon: Routledge, 2009).

which to assess the development and acquisition of the future aircraft carriers and the role of a potential British maritime strategy. This approach is influenced by General Sir Rupert Smith, formerly a British officer and NATO Deputy Supreme Allied Commander Europe, who has written on the importance of understanding the utility of force.[9]

Underpinning the analysis in this thesis is the use of historical example to inform and guide the development of the assessment of the strategic utility of maritime forces, including aircraft carriers, and whether a maritime strategy would be of value to British national policy. Professor Andrew Lambert describes the role of history in strategic analysis thus:

> History does not give us answers; it helps us by providing the evidence from which we develop our own ideas. Strategy, by imposing system and order on that evidence, speeds up the process of absorption: it allows the many to access the experience and understanding of a truly unique mind. The process is dialectic, history informs strategic questions, which in turn, can direct historical research, and ensure the strategist has a more secure foundation in fact as they proceed. The constant dialogue between history and strategy that deployed to such great effect is difficult to sustain, but vital.[10]

Significance of the Research

The analysis in this thesis is intended to serve three principal purposes. First, the study of the contemporary development of British maritime thinking and doctrine, its links with wider British thinking on national policy, and the particular case study of the future aircraft carrier programme is designed to assess the role and contribution of seapower to the attainment of British national policy objectives. This is important as the relative role and contribution of maritime versus continental approaches (for example, land-centric, Euro-centric and or stabilisation/constabulary-based force concepts)[11] to British national policy has been, and continues to be an enduring aspect of British strategic debate.[12] Thus,

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[9] Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (London: Penguin Books, 2006).
[10] Andrew Lambert, 'Sir Julian Corbett and the Naval War Course', in Peter Hore (ed.), *Dreadnought to Daring: 100 Years of Comment, Controversy and Debate in The Naval Review*, (Barnsley: Seaforth, 2012), pp.37-52, quotation, p.51.
[11] See, for example, Institute for Public Policy Research, 'Shared Responsibilities: A National Security Strategy for the United Kingdom', Final Report of the IPPR Commission on National Security in the 21st Century (London, 2009).
[12] See, for example, David French, *The British Way in Warfare, 1688-2000* (London: Unwin Hyman, 1990).

the analysis within this thesis, in particular chapter six – 'The Future Aircraft Carrier Programme and British Maritime Strategy' – which is explicitly designed to compare the utility of maritime and non-maritime approaches to British strategy, is of potential significance to this debate.

Second, the examination of the development and procurement of the future aircraft carriers is aimed at improving understanding of the contribution of aircraft carriers to British strategy and whether investment in such platforms is appropriate. The examination of the debate on aircraft carriers, the capabilities they are intended to provide, and potential alternative options, is intended to enhance knowledge on the utility, or otherwise, of aircraft carriers to British defence and national policy. The thesis particularly asks whether such ships are an essential component of a British maritime strategy, a discretionary 'nice to have' capability, or an inappropriate allocation of resources where their opportunity cost exceeds their utility.

Third, the thesis examines the strategic utility of maritime forces. This evaluates the value of the use of maritime power; that is, how and why do maritime-based approaches to the application of armed force serve the objectives of the state? This is via an approach based on an analysis of ends, ways and means, examining the development, deployment and employment of maritime forces. The rationale for determining the utility of maritime forces is to enhance the understanding of its value within the broader context of national power and especially national budgetary priorities. From this, analysis of the potential policy implications – both in defence and wider national policy terms - of choices concerning the development, deployment or employment of maritime capabilities can be enhanced. This can aid in improving the process of policy development and implementation.

Literature Overview

The research for this thesis focuses principally on the examination of secondary sources. This includes a core of 'key texts' within the maritime discourse, that is, the texts constituting the underlying knowledge base and terminology[13] for the

[13] 'Online QDA - Glossary'.

study of seapower and maritime strategy. This includes contributions by Corbett,[14] Alfred Thayer Mahan,[15] Gorshkov,[16] Rear Admiral Raja Menon,[17] Edward Luttwak,[18] Sir James Cable,[19] and Till;[20] plus the edited volume *The Development of British Naval Thinking*.[21] Selected contributions from the wider canon of literature on strategic thought are also of particular value; these include works by Carl von Clausewitz,[22] and General Sir Rupert Smith.[23] The aforementioned texts are labelled as 'key' for two reasons. Firstly, as in the cases of, for example, Mahan and Corbett, their contributions are defining works and thus essential to the understanding of seapower and maritime strategy. Secondly, the texts are significant to the thesis because of the particular concepts, themes or approaches to seapower, maritime strategy and/or national policy they evaluate. For example, Luttwak, Cable and Smith address the political aspect of the application of force; Menon seeks to assess the contribution of maritime strategy to the needs of continental powers (thus linking what are often perceived as conflicting requirements); and Till evaluates the interaction of seapower, maritime strategy and national policy. These texts are thus linked by a strand of thought concerned with the broader utility of maritime power (with the exception of Smith who is concerned with the general utility of force) and its link to wider national policy.

The doctrinal and conceptual documents published by the Ministry of Defence, in particular by the Development, Concepts and Doctrine Centre (DCDC), provide a significant insight into the intellectual development and evolution of British military thinking. For the purposes of the thesis, the following documents have

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[14] Corbett, *Some Principles of Maritime Strategy* and *England in the Seven Years' War: A Study in Combined Strategy* (2 Vols) (Cambridge: Cambridge University Press, 2010) [reprint of the original Longmans, Green, and Co. 1907 edition].
[15] Alfred Thayer Mahan, *The Influence of Sea Power Upon History 1660-1783* (Mineola, New York: Dover Books, 1987) [unabridged republication of the fifth edition (1894); originally published by Little, Brown and Company: Boston, 1890].
[16] Gorshkov, *The Sea Power of the State*.
[17] Raja Menon, *Maritime Strategy and Continental Wars* (Abingdon: Frank Cass, 1998).
[18] Luttwak, *The Political Uses of Sea Power*.
[19] James Cable, *Gunboat Diplomacy 1919-1979: Political Applications of Limited Naval Force*, Third Edition (Basingstoke: Macmillan Press Ltd, 1999), and *The Political Influence of Naval Force in History* (Basingstoke: Palgrave Macmillan Press Ltd, 1998)
[20] Till, *Seapower.*
[21] Geoffrey Till (ed.), *The Development of British Naval Thinking* (Abingdon: Routledge, 2006).
[22] Clausewitz, Carl von, *On War*, Edited and Translated by Howard, Michael and Paret, Peter (Princeton, New Jersey: Princeton University Press, 1976).
[23] Smith, *The Utility of Force.*

provided particular value; *British Defence Doctrine*,[24] the *Future Maritime Operational Concept*,[25] the *Littoral Manoeuvre Concept*,[26] *Global Strategic Trends*,[27] the *Future Character of Conflict*,[28] the *Future Land Operating Concept*[29] and *UK Air and Space Doctrine*.[30] In addition, the *Strategic Defence Review*,[31] *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*,[32] and *Securing Britain in an Age of Uncertainty: The National Security Strategy*[33] constitute a body of primary sources that provide the context for the development of British Defence Policy from 1998 to the present.

British Maritime Doctrine[34] is an especially useful publication. It provides an authoritative statement on the British view of the application, and utility of maritime power at principally the strategic (and to a lesser extent, the operational) level. This makes it particularly valuable for the thesis in that it explains the role of the maritime environment in relation to the grand strategic context and the joint campaign. It also provides *From Trafalgar to Today: A Bibliographical Essay on Doctrine and the Development of British Naval Strategic Thought* which discusses the broad range of contributions to the development of naval and maritime thinking and can thus aid in the further development of the thesis. Further, *British Maritime Doctrine* itself provides a means of evaluating the development of British naval and maritime thinking through the evolution of successive iterations of the document. BR1806 was originally promulgated in 1995 as *The Fundamentals of British Maritime Doctrine*,[35] subsequently reissued in 1999 as

[24] MoD/DCDC, *British Defence Doctrine* (Joint Doctrine Publication 0-01, 2011).
[25] MoD (UK), *Future Maritime Operational Concept* (2007).
[26] Royal Navy, *Littoral Manoeuvre Concept* (2003).
[27] MoD/DCDC, *Strategic Trends Programme: Global Strategic Trends – Out to 2040* (Fourth Edition, 2010).
[28] MoD/DCDC, *Future Character of Conflict* (2010).
[29] MoD/DCDC, 'Future Land Operating Concept', (Joint Concept Note 2/12, 2012).
[30] MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, 2013).
[31] MoD, *The Strategic Defence Review*, Cm 3999 (London: The Stationery Office, 1998).
[32] Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (SDSR), Cm 7948 (London: The Stationery Office, October 2010).
[33] Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The National Security Strategy* (NSS), Cm 7953 (London: The Stationery Office, 2010).
[34] MoD (UK), *British Maritime Doctrine* (BR 1806), Third edition (London: The Stationery Office, 2004).
[35] MoD (UK), *The Fundamentals of British Maritime Doctrine* (BR 1806), (London: HMSO, 1995).

British Maritime Doctrine,[36] further updated via in 2004, and was succeeded in 2011 with the promulgation of *British Maritime Doctrine* as a joint doctrine publication.[37]

The principal focus for the thesis is the role and utility of a potential British maritime strategy. This requires an analysis and understanding of the development of British thinking on the role, utility and wider position of maritime power within British national strategy. This is examined in *The Development of British Naval Thinking*, an edited volume including contributions from Rear Admiral Richard Hill, Professors Geoff Till, Andrew Lambert and Eric Grove. Of particular note are two chapters by Till that examine the evolving context of British naval thinking and wider debates on the maritime contribution to British strategy, for example, Captain Sir Basil Liddell Hart's notion of a 'British way in warfare'.[38] *The Development of British Naval Thinking* also includes a contribution from Grove on the development of British maritime doctrine in the late 1990s.[39] This provides a valuable insight into the formulation of *The Fundamentals of British Maritime Doctrine* and the subsequent second edition of BR1806, including the translation of academic thought into doctrine. It warrants mention that Eric Grove was along with (then Commander, Royal Navy) Michael Codner, a principal author of *The Fundamentals of British Maritime Doctrine*.

A major influence on the development of the thinking for this thesis is the intention to assess the utility of maritime forces. This is based on three points raised by General Sir Rupert Smith. Smith states, with regard to the utility of force that: 'for force to be effective the desired outcome of its use must be understood in such detail that the context of its use is defined as well as the point of application'.[40] He also states, more importantly: 'military force is a valid option, a lever of intervention and influence, as much as economic, political and diplomatic levels, but to be effective it must be applied as part of a greater scheme focusing

[36] MoD (UK), *British Maritime Doctrine* (BR 1806), Second Edition, (London: The Stationery Office, 1999).
[37] MoD/DCDC, *British Maritime Doctrine* (Joint Doctrine Publication 0-10, 2011).
[38] Till, 'Richmond and the Faith Reaffirmed: British Naval Thinking Between the Wars', in Till (ed.) *The Development of British Naval Thinking*, p.109.
[39] Eric Grove, 'The Discovery of Doctrine: British Naval Thinking at the Close of the Twentieth Century', in Till (ed.) *The Development of British Naval Thinking*, pp.182-191.
[40] Smith, p. 398.

all measures on the one goal'.[41] That is, within the context of a wider national strategic objective.

In addition to the aforementioned, the *Journal* and other publications of the Royal United Services Institute for Defence and Security Studies provide a significant contribution to the on-going debates in Britain on national and international defence, foreign and national security policy and strategy issues. Moreover, the Royal United Services Institute provides a highly useful conduit through which it is possible to access subject-matter experts and both retired and serving officials with knowledge directly applicable to the thesis.

A particularly valuable journal is *The Naval Review*. This is the professional journal of the Royal Navy and via the arrangements governing contributions to the journal, provides an especially insightful perspective into British naval thinking and debates within the Royal Navy. An additional journal of merit is *Defence Studies*. This is the official journal of the Joint Services Command and Staff College and is intended to provide a discussion of all aspects of defence. The June 2008 edition of the journal is especially useful as it marked the launch of the King's College London Corbett Centre for Maritime Policy Studies. This edition includes contributions from Dr Tim Benbow,[42] Professor Eric Grove,[43] Dr Ian Speller,[44] and Professor Geoffrey Till[45] that have contributed to the development of the thesis. The Corbett Centre for Maritime Policy Studies own series of papers (*Corbett Papers*) also provide a valuable source of insight, in particular *Corbett Paper No.6* by Professor Geoffrey Till on British strategy post-Afghanistan[46] and *Corbett Paper No.9* by Tim Benbow, which provides an historical survey of British uses of aircraft carriers and amphibious ships since 1945.[47]

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[41] *Ibid*., p. 399.
[42] Tim Benbow, 'Naval Power and Technological Change', *Defence Studies*, Vol.8, No.2 (June 2008), pp. 207-226.
[43] Eric Grove, 'The Naming of the Parts: Corbett's Theory of the Means Reconsidered', *Defence Studies*, Vol.8, No.2 (June 2008), pp. 180-189.
[44] Ian Speller, 'Corbett, Liddell Hart and the "British Way in Warfare"', *Defence Studies*, Vol.8, No.2 (June 2008), pp. 227-239.
[45] Geoffrey Till, '*A Cooperative Strategy for 21st Century Seapower*: What's New? What's Next? A View from Outside', *Defence Studies*, Vol.8, No.2 (June 2008), pp. 240-257.
[46] Geoffrey Till, 'Back to Basics: British Strategy After Afghanistan', *Corbett Paper* No. 6 (Corbett Centre for Maritime Policy Studies, July 2011).
[47] Tim Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships: 1945-2010', *Corbett Paper* No. 9 (The Corbett Centre for Maritime Policy Studies, March 2012).

Chapter Overview

In order to answer the core question, the thesis employs the following approach. First, chapter one examines the maritime discourse from which to develop the theoretical basis for the study; this is applied in chapter two to the particular context of the evolution of British maritime thinking and doctrine. Second, and building upon the theoretical and conceptual content of chapters one and two, the thesis examines the application of theory to practice by means of the case study on the future aircraft carrier programme. The analysis of contemporary British maritime thinking and doctrine from chapter two serves as the basis for examining the rationale for the future aircraft carrier programme in chapter three. In this regard, the purpose of this chapter is to examine both in theoretical terms and with reference to historical experience, the strategic roles and utility of aircraft carriers in order to inform the analysis of the rationale underpinning Britain's decision to invest in the *Queen Elizabeth*-class. Chapter four will examine the design and development of the carriers and debate on the variant of fixed wing aircraft to be embarked: whilst chapter five will consider potential alternatives to the aircraft carrier and the role of maritime aviation within wider British airpower. Third, the thesis examines the role and utility of maritime strategy at the national policy level. Chapter six examines the impact of countervailing factors on the debate concerning the *Queen Elizabeth*-class aircraft carriers, before proceeding to consider the rationale for, and utility of a maritime strategy for Britain.

Thesis Structure

- ***Conceptual Analysis***

    1. *Defining the Context: Seapower, Maritime Strategy and National Policy*
    2. *The Development of Contemporary British Maritime Thinking and Doctrine: An Overview*

- ***Case Study on the Development of the Future Aircraft Carrier Programme***

    3. *The Rationale for the Future Aircraft Carrier Programme*
    4. *The Future Aircraft Carrier Programme: Design, Development and Debate*

5. *The Future Aircraft Carrier Programme and British Strategy: An Examination of Potential Alternatives*

- ***National Policy and the Role and Utility of Maritime Strategy***

6. *The Future Aircraft Carrier Programme and British Maritime Strategy*

Conclusion

The following is a brief synopsis of each chapter.

Chapter one, 'Defining the Context: Seapower, Maritime Strategy and National Policy', sets out the conceptual basis for the thesis. It critically evaluates the maritime discourse in order to define the principal concepts for the thesis; that is, seapower, maritime strategy and grand strategy; how the three concepts relate to each other; and the key principles, themes and ideas underpinning each of the three. It also considers how thinking on seapower and maritime strategy in particular has evolved. From this, the chapter proceeds to examine how seapower, maritime strategy and grand strategy serve as the basis for constructing a conceptual framework within which to analyse the utility of maritime forces.

Chapter two, 'The Development of Contemporary British Maritime Thinking and Doctrine: An Overview', assesses the development of contemporary British thinking on the roles and utility of maritime forces. It considers the translation of maritime theory, as discussed in the preceding chapter, into practice within the specific context of British naval, defence and national policy. The chapter includes a review of the British school of maritime thought and its core tenets in order to link the theoretical content of the preceding chapter with the analysis of contemporary British maritime thinking and doctrine in this chapter. As a case-study, the chapter examines the evolution of British maritime doctrine as promulgated in *The Fundamentals of British Maritime Doctrine*,[48] the subsequent second and third editions, re-titled as *British Maritime Doctrine*, published in 1999 and 2004 respectively and the fourth edition published as a joint doctrine, rather than single Service, publications in 2011. This chapter is particularly concerned with identifying the principal concepts, themes and ideas within British

[48] MoD, *The Fundamentals of British Maritime Doctrine* (BR1806) (London: HMSO, 1995).

naval thinking and their influence on the development of British maritime forces. It also establishes the context within which the decision to acquire the future aircraft carriers was made and their intended contribution to British defence and national policy formulated.

Chapter three, 'The Rationale for CVF', examines the background to the decision to replace the current *Invincible*-class aircraft carriers and considers the evolving operational-strategic context for British maritime airpower and its implications for the future aircraft carrier programme. This will particularly consider the shift from North Atlantic-based anti-submarine warfare to expeditionary, power-projection operations as the principal objective for British maritime strategy. That is, a shift in thinking from 'at sea' to 'from the sea' as the primary role for British seapower. From this analysis, which builds upon the discussion from the preceding chapter, the rationale for developing the future aircraft carrier programme can be assessed, including whether it has remained consistent or has shifted as the strategic situation has changed. This establishes the framework for the two subsequent chapters that evaluate the debate on the design, development and procurement of the future carriers.

Chapter four, 'The Future Aircraft Carrier Programme: Design, Development and Debate', examines the design and development of what become the *Queen Elizabeth*-class aircraft carriers. It particularly focuses on the debate concerning whether to build the ships in a short take-off and vertical landing or alternatively catapult-assisted take-off but arrested recovery configuration, and the associated debate on the variant of fixed-wing combat aircraft to be acquired to operate from the carriers. The preceding chapter examined the roles and utility of, and rationale for aircraft carriers in general strategic terms. This chapter builds upon that analysis and considers the development of what would become the *Queen Elizabeth*-class within the context of British strategic and operational requirements and seeks to evaluate whether the developmental path chosen for the future aircraft carrier programme constituted the most effective (in terms of cost and capability) option for Britain.

Chapter five, 'The Future Aircraft Carrier Programme and British Strategy: An Examination of Potential Alternatives', examines whether the opportunity cost of

investing in the Future Aircraft Carrier programme is justified by the capabilities that will be provided by the *Queen Elizabeth*-class, or whether potential alternative systems or approaches could equally or more effectively provide the capability required by British defence policy. This chapter, through a comparative analysis of potential alternatives, seeks to shed further light on the utility of aircraft carriers relative to the other options and assess their value to British maritime and grand strategy, and consider whether such platforms are a vital capability for Britain. It is also intended that the discussion within this chapter of the requirements of maritime strategy and British airpower will assess the wider role and utility of maritime forces to British strategy. This will form the basis for the analysis in the following chapter of the connection between maritime strategy and national policy.

Chapter six, 'The Future Aircraft Carrier Programme and British Maritime Strategy', considers the potential utility of a maritime strategy to British national policy. In order to do this, the chapter first examines the debate concerning the procurement of the *Queen Elizabeth*-class aircraft carriers within the context of wider British defence policy, in particular with regard to the impact on the programme of growing external pressures, namely, those relating to the implications of the conflicts in Iraq and Afghanistan, and the politico-economic context for the 2010 Strategic Defence and Security Review (SDSR). Proceeding from this, the chapter examines the rationale for, and utility of a potential maritime strategy for Britain. It does this by first considering Britain's strategic context and the evolving international environment. This provides the context for considering the military utility of a maritime strategy and its implications for maritime and wider force development and British national policy. This chapter builds upon the analysis in chapters one and two, which considered the definition and British interpretation of maritime strategy, and the analysis in the following chapters of the debates concerning the rationale for and design and development of the Future Aircraft Carriers, in particular with regard to the wider role and contribution of the carriers to British defence and national policy.

The Conclusion examines three principal issues underpinning the analysis throughout the thesis; the role of aircraft carriers in British strategy; the strategic

utility of maritime forces and whether there is a requirement for a Maritime Strategy; and the connection between British national policy and maritime strategy. Those issues are considered via three questions: to what extent are aircraft carriers an essential component of British strategy and what would be the implications of foregoing the capability they provide? Why would a Maritime Strategy be of utility to the UK, and what would be the implications for British national policy? Finally, how does national policy influence the development of strategy and the requirement for particular military capabilities?

1. Defining the Context: Seapower, Maritime Strategy and National Policy

Introduction

The overarching context for this chapter, and the thesis as a whole, is that provided by the interaction of seapower, maritime strategy and national policy and the influence of each on the other. The purpose of this chapter is to define the theoretical basis for this relationship within which to consider the concept of the utility of maritime force. This concept is founded on the question: what value do armed forces operating at or from the sea have in terms of contributing toward the attainment of national political objectives? Professor Geoffrey Till defines strategic theory as 'thinking about strategy, trying to "put it all together" through the development of a skein of connected thought about the nature, conduct and consequences of naval power'.[1] In this context, examining the utility of maritime force would provide this 'skein of connected thought'. This is because, as General Sir Rupert Smith states:

> ...To apply force with utility implies an understanding of the context in which one is acting, a clear definition of the result to be achieved, an identification of the point or target to which the force is being applied – and ... an understanding of the nature of the force being applied.[2]

That is, to determine the utility of maritime force, the nature and conduct of the force and the consequences of its use, in relation to an overarching objective and the context within which it is operating, require definition. In order to do this, the respective meanings of seapower, maritime strategy and national policy require examination. In the case of seapower and maritime strategy, their meaning as individual concepts needs defining but also their meaning in respect of each other. The meaning of national policy, in particular vis-à-vis the concept of grand strategy, also requires discussion.

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[1] Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Second Edition (Abingdon: Routledge, 2009), p.41.
[2] Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (London: Penguin Books, 2006), p.6.

The term 'maritime force' is used in this thesis, as opposed to 'naval force'; the former term is concerned with forces whose primary purpose is the conduct of military operations at and from the sea (including warships, submarines, organic aircraft, auxiliaries plus shore-based maritime aircraft, aircraft assigned to maritime tasks, and batteries) in contrast to the latter which refers to seaborne forces (ships, submarines, organic aircraft, etc.).[3] This is because the focus for the thesis is not on the role, conduct or nature of naval forces. Rather, the focus is on the role of the sea as a means by which to utilise the armed instrument in support of national objectives; naval forces are a key actor within this but the term encompasses the armed forces in general. Further, in referring to the utilisation of the armed instrument, this does not refer solely to the use of the sea for combat purposes. The literature on seapower refers to a range of non-combat tasks for maritime forces including as elements of a politico-diplomatic mechanism;[4] a means for providing humanitarian and disaster relief;[5] and as a means of ensuring good order at sea.[6] For example, *British Maritime Doctrine* divided the application of maritime power into three categories; military, constabulary (such as peacekeeping and maritime counter-terrorism) and benign (such as search and rescue and the provision of military assistance to allies), on the basis of degree, and or relevance, of combat power required.[7]

This nuanced approach to the understanding of the application of maritime power is significant as it sheds light on the broader context within which maritime force functions beyond a purely military setting. This is valuable for assessing the wider contribution of maritime force to national objectives. It also aids in examining the relationship between seapower and maritime strategy; this in turn sets the context for evaluating the maritime contribution to national policy. However, in order to do this, there needs to be a clear understanding of what is meant by the term 'seapower'.

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[3] MoD (UK), *British Maritime Doctrine* (BR1806), Third edition (London: The Stationery Office, 2004), p.271 and p.277.
[4] For example, see Edward N. Luttwak, *The Political Uses of Sea Power* (Baltimore and London: The John Hopkins University Press, 1974) and Sir James Cable, *Gunboat Diplomacy, 1919-1991: Political Applications of Limited Naval Force*, Third Edition (Basingstoke: Macmillan, 1994).
[5] For example, see Till, *Seapower*, pp.250-252 and pp.339-340.
[6] For example, see ibid., pp.286-321.
[7] *British Maritime Doctrine* (BR1806), p.90.

Defining Seapower

In examining the concept of seapower, its constituents and consequences are fundamentally a reflection of the nature of broader state power and how it interacts with the maritime domain. In his preface and introduction to *The Influence of Sea Power Upon History 1660-1783*, Alfred Thayer Mahan suggests, respectively, sea power to be 'putting maritime interests in the foreground, without divorcing them, however, from their surroundings of cause and effect in general history, but seeking to show how they modified the latter, and were modified by them';[8] and 'largely, though by no means solely, a narrative of contests between nations, of national rivalries, of violence frequently culminating in war'.[9] Mahan does not however, explicitly define the term 'sea power'; the meaning has to be inferred from his writing. The above quotations from *The Influence of Sea Power* provide insight into Mahan's thinking on the nature of seapower. In particular, he refers, in the first quotation, to 'maritime interests' in a general sense, and in the second, his description of the history of seapower as a 'narrative of contests between nations' is akin to realist thinking in international relations. This latter point is especially significant as a means of providing insight into Mahan's conception of the international system. Realism is summarised by Scott Burchill of Deakin University in the following terms:

> … the world is revealed … as a dangerous and insecure place, where violence is regrettable but endemic… realists give high priority to the centrality of the nation-state in their considerations, acknowledging it as the supreme political authority in the world…. The international realm is characterised by conflict, suspicion and competition between nation-states…[10]

In this context, a state's influence, that is, the ability to effect positively or negatively other actors' (such as states, inter-governmental and non-governmental organisations) thinking, policies and actions, is, to a significant degree, determined by its martial potency. Further, although Mahan refers to national rivalries becoming violent and often resulting in war, he does not explicitly define seapower as a military concept; the military element of seapower is provided by

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[8] Alfred Thayer Mahan, *The Influence of Sea Power Upon History 1660-1783* (Mineola, New York: Dover Books, 1987) [unabridged republication of the fifth edition (1894); originally published Boston: Little, Brown and Company, 1890], p.vi.
[9] Ibid., p.1.
[10] Scott Burchill, 'Realism and Neo-realism' in Scott Burchill, et al, *Theories of International Relations*, 2nd Edition (Basingstoke: Palgrave, 2001), p.70.

naval strategy. This, Mahan defines as '... for its end to found, support, and increase, as well in peace as in war, the sea power of a country'.[11]

This definition of naval strategy is important as it suggests naval force is an input from which seapower emerges as an output. It also raises the broader question of what constitutes seapower. Mahan dedicates the first chapter ('Discussion of the Elements of Sea Power') of *The Influence of Sea Power* to this question. Three key points emerge from this chapter. The first, and a critical component of understanding the utility of the maritime environment, is that the sea constitutes a means of communication; Mahan describes it as a 'great highway ... a wide common'.[12] The latter word is especially valuable with regard to assessing the utility of maritime forces. This is because, as a common, the high seas are not subject to restriction from a sovereign authority. That is, military forces can operate without restriction and the need for host-nation support, over-flight permissions, etc.. This is in contrast to land and air forces (with the exception, to an extent, of strategic platforms such as long-range bombers)[13], which are dependent on host-nation support, which even within an established alliance, for example NATO, can require protracted negotiation. In this regard, Till cites the example of the time taken to deploy tactical airpower in support of operations in the Former Yugoslavia in 1992; ten days for an aircraft carrier to take up station versus three months for airbases in Italy (a NATO member) to become operational.[14]

The second key point to emerge is that of the multi-dimensional character of seapower. This is evident in Mahan's six principal conditions influencing the seapower of a state: geography; physical conformation; extent of territory; population; character of the people (also referred to as national character); and character of the government. Of these, within 'national character', Mahan states 'The tendency to trade, involving of necessity the production of something to

[11] Ibid., p.23.
[12] Mahan, *Influence of Sea Power*, p.25.
[13] A notable example in this regard is the US Air Force's use of B-52H, B-1B and B-2A bombers in intercontinental sorties from bases in the continental United States in operations against Iraq on a number of occasions in the 1990s and Yugoslavia in 1999.
[14] Till, *Seapower*, p.127.

trade with, is the national characteristic most important to the development of sea power'.[15]

This leads to the third key point of the chapter and *The Influence of Sea Power* more generally, and that is the input of primary importance to seapower is economic. In his analysis of Colbert's reforms of the French State under Louis XIV, Mahan refers to Colbert's policy of developing French productive capacity, overseas trade and commerce, and a navy to support French commerce as developing 'the chain of seapower'.[16] That is, the basis for naval strength is founded upon, to use modern parlance, a developed industrial base and international trade. This conception of seapower as a chain is again used in reference to its role in developing the wealth of the state: 'the dual use and control of the sea is but one link in the chain of exchange by which wealth accumulates; but it is the central link...'[17] In this context, the 'chain' extends beyond the constituents of seapower to include the foundation of state power. This is significant and along with Mahan's analysis of Colbert's reforms, the rise and fall of Dutch maritime strength and the growth of British seapower, the role of government in either promoting the growth of, or neglecting seapower is emphasised. For example, in concluding his analysis of the impact of Louis XIV's national policy, in particular with regard to his abandonment of Colbert's policies, Mahan states: '[The simplicity of form in an absolute monarchy thus brought out strongly] how great the influence of government can be upon both the growth and the decay of sea power'.[18]

In light of the above, a Mahanian definition of seapower would be based on the following principles. Maritime interests broadly defined, but focusing particularly on its commercial, trade and military aspects, constitute the context for a state's interactions with the sea. The sea constitutes a means of communication, especially with regard to the conduct of trade. The conduct of maritime trade generates wealth 'from which alone a military fleet naturally and healthfully springs, and on which it securely rests'.[19] This provides the basis for naval

[15] Mahan, *Influence of Sea Power*, p.53.
[16] Ibid., p.70.
[17] Ibid., pp.225-226.
[18] Ibid., p.74.
[19] Ibid., p.28.

strategy. In addition, a core of natural and human inputs shape the development of a state's seapower, which is itself is an output and can be consciously influenced by the conduct of national policy. Finally, seapower is a relative concept: it is a component of a state's wider international position and subject to the influences of a dynamic international context. For example, Mahan in *The Influence of Sea Power* examines the evolving European regional system and its implications on the seapower of its principal actors in the latter 17th and 18th centuries.

The above five points provide the contours within which to develop the concept of seapower. In varying degrees and forms, the aforementioned characteristics of seapower recur subsequently through the literature and shape approaches to the application of maritime force. The roles and means by which (to use Mahan's term) naval strategy is applied will be discussed subsequently in this chapter.

The economic aspect of seapower is centrally placed within Admiral Sergei Gorshkov's *The Sea Power of the State*. Gorshkov's definition of seapower is illustrative of this: 'in the definition of the sea power of the state we include as the main components possibilities for the state to study (explore) the ocean and harness its wealth...';[20] further, he states 'the character of the use of the ocean and the degree of development of these components are ultimately determined by the level of economic and social development reached by the state and by the policies it pursues'.[21] The utility of seapower is defined by Gorshkov as 'one of the important factors for strengthening its economy [the Soviet Union], accelerating scientific and technical development and consolidating the economic, political, cultural and scientific links [of the Soviet people with the peoples and countries friendly to it]'.[22] This quotation highlights two important points. Firstly, it emphasises the connection between seapower and economic development, and second, the reference to 'consolidating the economic, political, cultural and scientific links' resonates with Mahan's invocation of the sea as the central link between states. Gorshkov does not ignore the role of naval forces as a component of seapower but emphasises the economic foundation for sea-, military and state power. Thus,

[20] Sergei Gorshkov, *The Sea Power of the State* (Oxford: Pergamon Press Ltd, 1979), p.1.
[21] Ibid.
[22] Ibid., p.2.

> It must be regarded primarily as the capacity of the state to place all the resources and possibilities offered by the ocean ... and make full use of them to develop the economy, the health of which finally determines all facets of the life of our country including its defence capability. In this context the concept of sea power to a certain degree is identified with the concept of the economic power of the state. Accordingly sea power may be regarded as a constituent part of economic power ... sea power, mediated by the economy of the state and exerting an influence on it, carries within it an economic and military principle.[23]

This remains an important point. The development of a state's instruments of power is substantially dependent on its economic capabilities. The principal driver, arguably, for the 2010 British Strategic Defence and Security Review was that of determining defence requirements within the constraints of a reduced economic base and poor public finances.[24] This has a concomitant effect on British maritime capabilities.[25]

The conception of seapower Gorshkov elucidates places it within the broader context of state power and national policy. The latter has to be noted albeit against the context within which Gorshkov was writing; that is, as a senior member of the Soviet elite and thus actively promulgating communism and a high degree of state control. This does not detract however, for the most part from Gorshkov's approach to seapower, which is to an extent, similar to that of Mahan.[26] It is important to note in the last part of the above passage from Gorshkov, the phrase describing seapower as: 'mediated by the economy of the state and *exerting an influence on it* [emphasis added]'. That is, seapower is both influenced by, and is an influence on, the trajectory of a state's national policy. Mahan, for example, highlights the role of the British governing classes in continuing to maintain and expand British seapower on the premise that it constituted the basis for British national power.[27] In other words, a favourable national policy context for the development of seapower was in part engendered by the influence of seapower on the wealth and power of the state as a whole. Till puts this into the context of a

[23] Ibid., p.2.
[24] Dr Liam Fox, then Secretary of State for Defence, 'The Need for Defence Reform', Speech delivered at the Royal Institute of Chartered Surveyors, 13 August 2010, https://www.gov.uk/government/speeches/2010-08-13-the-need-for-defence-reform. Accessed 9 September 2013.
[25] Jeremy Blackham and Gwyn Prins, 'Why Things Don't Happen: Silent Principles of National Security', *RUSI Journal*, Vol.155, No.4 (August 2010), pp.14-22.
[26] Till in *Seapower*, p.55, cites a response by Gorshkov to a US admiral's suggestion that he sounded Mahanian in which he said: 'And why not? The man was eminently sensible'.
[27] Mahan, p.66.

'virtuous maritime circle' based on maritime trade leading to increased maritime resources, leading to increased naval strength, which leads to maritime supremacy and thus to more maritime trade, and so on.[28]

The notion of a virtuous maritime circle aids in conveying the multifaceted nature of seapower. The approach Till employs to the defining of seapower is particularly valuable. Till bases his definition on four key attributes of the sea: its role as a resource; as a medium of transportation and exchange; as a medium for information and the spread of ideas; and as a medium for dominion.[29] This has continuity with enduring ideas concerning the use of the sea; for example, its role as a means of communication, its value in resource terms and its role in international competition and confrontation. Notably, only one of the attributes of seapower relies on the use of force. Moreover, Till suggests that 'seapower can best be represented as a tight and inseparable system in which naval power protects the maritime assets that are the ultimate source of its effectiveness'.[30] This is significant as it links the naval aspect of seapower with the broader maritime setting. This is important because, as Till states:

> 'Maritime' activity for example is sometimes taken to concern only navies, sometimes navies operating in conjunction with the ground and air forces, sometimes navies in the broader context of all activities relating to the commercial, non-military use of the sea, and sometimes inevitably the word 'maritime' covers all three possibilities![31]

He also suggests the interchangeable usage of 'maritime power' and 'seapower' to 'incorporate naval interactions with the civilian/marine dimension on the one hand and with air and ground forces on the other...'[32] The emphasis on the maritime aspect is to establish the link between the sea and land; that is, seapower is 'about the sea-based capacity to determine events both at sea and on land'.[33] Two of the four aforementioned attributes of the sea are particularly indicative of this maritime approach: the sea as a medium for information and the spread of ideas, and as a medium for dominion. This is because to spread ideas to, and or achieve dominion over, other peoples requires interaction in one respect or another with

[28] Till, *Seapower*, p.34.
[29] Ibid., pp.24-31.
[30] Ibid., p.34.
[31] Ibid., p.20.
[32] Ibid., p.23.
[33] Ibid., p.21.

those peoples, thus necessitating interaction with the land environment. This highlights a key element of Till's perspective: 'the real point of seapower is not so much what happens at sea, but how that influences the outcome of events on land'.[34]

The capacity of seapower to influence is inherently multidimensional, for example, Till suggests 'Seapower also includes the non-military aspects of sea use (merchant shipping, fishing, marine insurance, shipbuilding and repair and so on) since these contribute to naval power and since they can also influence the behaviour of other people in their own right'.[35] This description of the non-military components of seapower again emphasises its multifaceted nature and varied constituents. Till defines the constituents of seapower as a state's military maritime capabilities, its civilian maritime capabilities plus naval operations and commercial operations.[36] The distinction between military maritime capabilities and naval operations is significant; the former are defined as including 'navies, coast guards ... and, where relevant, the contribution of land and air forces'; whereas the latter refers to seaborne operations. This distinction highlights a key point made by Till:

> Seapower is not simply about what it takes to use the sea (although that is obviously a prerequisite). It is also the capacity to influence the behaviour of other people or things by what one does at or from the sea. This approach defines seapower in terms of its consequences, its outputs not the inputs, the ends not the means.[37]

In this context, seapower can be defined both as an input and an output. It is however, the latter which is most important; that is, the consequences of its application, or the utility of seapower. Further, Till explicitly sets seapower as a distinct entity within the broader context of national policy.[38] This enables seapower to be considered in a holistic sense in relation to national policy, but also its specific components (such as military maritime capabilities) as derivatives of seapower and their relation to the broader national policy level.

[34] Ibid., p.22.
[35] Ibid.
[36] Ibid., p.21.
[37] Ibid.
[38] Ibid., figure 2.1.

The reference to two constituents of military seapower – military maritime capabilities and naval operations, is in contrast to, for example, Mahan's single naval strategy-based approach. This is because in referring to both naval operations and military maritime capabilities as constituting the military component of seapower, Till is including the armed forces as a whole, and not just naval forces, as forming the state's military maritime power.[39] This approach to thinking about the military uses of seapower is a reflection of the influence of Sir Julian Corbett. His approach, as defined in *Some Principles of Maritime Strategy*, delineated the roles of a maritime strategy and a naval strategy:

> The paramount concern, then, of maritime strategy is to determine the mutual relations of your army and navy in a plan of war. When this is done, and not till then, naval strategy can begin to work out the manner in which the fleet can best discharge the function assigned to it.[40]

That is, maritime strategy combines the military maritime capabilities of the state with its naval operations; this equates to the military component of seapower. This sets maritime strategy within the context of, as defined by Corbett, major strategy:

> Major Strategy (always regarding the ulterior object) has for its province the plan of the war, and includes: (1) Selection of the immediate or primary objects to be aimed at for attaining the ulterior object; (2) Selection of the force to be used, *i.e.*, it determines the relative functions of the naval and military forces.[41]

It also links seapower and maritime strategy to national policy. This is due to Corbett's emphasis on the 'ulterior object', that being 'every operation must be regarded, not only from the point of view of its special object, but also as a step to the end of the campaign or war'.[42] This is in contrast to Mahan who was critical of the pursuit of ulterior objectives in naval operations,[43] and had a more narrowly-focused naval conception of seapower as opposed to the broader maritime perspective of Corbett.[44] This difference in emphasis on the ends of seapower is significant for both the defining of seapower and the utility of maritime force. This is because a key element of defining the utility of force is, to reiterate Smith's point, having 'a clear definition of the result to be achieved ... and an

[39] Ibid., p.21.
[40] Sir Julian Corbett, *Some Principles of Maritime Strategy* (reprinted with 'Introduction' by Eric Grove (Annapolis, MD: Naval Institute Press, 1988)), p.16.
[41] Ibid., p.308.
[42] Ibid., p.307.
[43] See, for example, Mahan, *Influence of Sea Power*, p.537.
[44] Till, *Seapower*, p.59.

understanding of the nature of the force being applied'. In this context, the contrasting viewpoints of Mahan and Corbett influence the definition of required results and the nature of the force being applied. The following section concerning the defining of maritime strategy will examine more closely the differences in perspective concerning the naval versus maritime approaches and the implications for the application of seapower.

In light of the above literature survey, seapower can be defined on the basis of the following. Seapower is the output derived from the combination of natural, human and state-influenced factors that provide the context for the state's ability to exploit the sea in support of national policy objectives. It is based on the economic power of the state and that provides the foundation for the development of a state's military maritime capabilities.[45] Seapower is derived from the attributes of the sea itself;[46] in particular, the sea constitutes a means of communication in both the tangible (such as tradable goods) and intangible (for example, ideas). This provides the means to exert influence. Maritime strategy provides the means to apply a state's military maritime capabilities, in conjunction with the wider military capacity of the state, in order to attain national strategic objectives. In short, seapower constitutes the state's capacity and capabilities to utilise the sea in its broadest terms in support of national political objectives.

Defining Maritime Strategy

In order to set the context for the following discussion, a point of terminology requires clarification. This concerns the use of the phrase 'maritime strategy'. At this point, the use of the phrase 'maritime strategy' should not be taken as a bias towards Corbett's particular approach. The use of the word 'maritime' is to establish that the environmental context is 'of the sea' but not limited to 'at sea'. The word 'strategy' is used to connote, as defined by Captain Sir Basil Liddell Hart, 'The art of distributing and applying military means to fulfil the ends of

[45] Correlli Barnett in *Engage the Enemy More Closely: The Royal Navy in the Second World War* (London: Penguin Books, 2001), p.880, eloquently suggests, using the analogy of a warship, that 'A navy is no more than the armour and the weapons-system of seapower. The hull, providing essential buoyancy, is the national wealth. The propulsion is commercial and industrial success, which creates the national wealth.'
[46] Till, *Seapower*, p.23.

policy'.[47] The term 'maritime strategy' is used by different authors to convey different meanings. For example, Rear Admiral Raja Menon defines 'maritime strategy' as:

> For countries that are involved in a war in one theatre only – wars in which the army, navy and air force are employed as one composite whole – the definition of maritime strategy becomes easy. It is the strategy for using an entire navy. Where it becomes impossible to use an entire navy and it perforce has to split its forces into separate geographic entities, the war is assumed to have separate theatres. The use of a navy in a theatre could then also require a maritime strategy.[48]

This quotation defines 'maritime strategy' as the strategic application of *naval* forces; it does not mention the contribution of relevant land or air forces. Menon does subsequently refer to Corbett's approach to the defining of maritime strategy, and uses it as the benchmark for the development of his approach.[49] This section is thus concerned with how to define 'maritime strategy', its relation to seapower, and the position of maritime strategy within the wider context of military strategy and national policy.

From the preceding discussion of the constituents of seapower, there emerges a point of difference concerning the ends of seapower, that is, a narrowly-focused naval conception versus a broader maritime view. In this context, Admiral Sir Cyprian Bridge (1839-1924), the second Director of Naval Intelligence in the Admiralty and close friend of Professor Sir John Knox Laughton,[50] made the following significant point:

> Sea power, at any rate in the narrow sense of naval strength, has, as should always be remembered, its limits ... Most maritime states are continental and are not likely to be conquered unless land forces are used against them ... This brings out the importance of including plans for joint expeditions in a scheme of belligerent action. The mere act of looking at the problems raised will enforce the doctrine that in any great war in which insular and maritime state may be involved, co-operation between the land and sea-services must be frequent.[51]

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[47] Captain Sir Basil Liddell Hart, *Strategy: The Indirect Approach* (London: Faber and Faber, 1967), p. 335 cited in Till, *Seapower*, p.41.
[48] Rear Admiral Raja Menon, *Maritime Strategy and Continental Wars* (Abingdon: Frank Cass, 1998), pp.22-23.
[49] Ibid., p.23.
[50] Andrew Lambert, 'The Development of Education in the Royal Navy: 1854-1914', in Geoffrey Till (ed.) *The Development of British Naval Thinking* (Abingdon: Routledge, 2006), pp.34-59, specifically, p.48.
[51] Admiral Sir Cyprian Bridge, *The Art of Naval Warfare* (London: Smith, Elder, 1907), cited in Till, 'Corbett and the Emergence of a British School?' in Till (ed.), *The Development of British Naval Thinking*, pp.60-88, specifically p.72.

This quotation is notable in two respects. First, Admiral Bridge distinguishes between 'maritime' and 'insular' states. This is interesting as an 'insular', or island, state is a 'maritime' state, but Bridge states 'most maritime states are continental'; this would thus add an additional distinction between a 'maritime' power such as France and an 'insular' power such as Great Britain. The French naval officer and thinker Admiral Raoul Castex (1878-1968) also differentiated between 'an island or semi-insular belligerent', and Eugenia Kiesling, the editor and translator of Castex's principal five-volume work *Théories stratégiques* (*Strategic Theories*), notes that Castex 'several times repeats this typology of island, coastal, and continental states' within his analysis of the defining of command of the sea.[52]

Second, it is also in distinct contrast to the perspective of Mahan; 'the sphere of the fleet is on the open sea, its object offence rather than defence, its objective the enemy's shipping wherever it can be found'.[53] That is, Mahan advocated a blue-water approach that placed naval power at the centre of seapower, and as previously mentioned, defined the military element of seapower as naval strategy. The core aim of naval power was to attain command of the sea: 'Control of the sea by maritime commerce and naval supremacy means a predominant influence in the world ... [and] is the chief among the merely material elements in the power and prosperity of nations'.[54] Mahan's aforementioned criticism of ulterior objects in naval operations was based on his emphasis on securing military command of the sea as the prerequisite to follow-on operations. For example, in the context of the value of commerce-raiding, Mahan states: 'Only by military command of the sea by prolonged control of the strategic centres of commerce, can such an attack be fatal; and such control can be wrung from a powerful navy only by fighting and overcoming it'.[55] Mahan does not ignore the influence of seapower upon the land, but at the same time does not explicitly examine or describe the link between success (or failure) at sea and success (or failure) on land. He alludes to, in *The Influence of Sea Power Upon History*, the British naval weakness in the American

[52] Admiral Raoul Castex, *Theories Strategiques* (5 vols) (Paris: Societé d'Editions, 1929-1935), reprinted as Eugenia C. Kiesling (ed.) *Strategic Theories* (Annapolis, MD: Naval Institute Press, 1994), p.41.
[53] *Mahan, Influence of Sea Power*, p.453.
[54] Cited in Till, *Seapower*, p.52.
[55] Mahan, *Influence of Sea Power*, pp.539-540.

War of Independence and its implications for the Yorktown campaign, implying that French control of the sea around the American eastern seaboard denied an effective British use of seapower to aid the campaign onshore, for example, via the relief of Cornwallis's besieged force at Yorktown.[56] The implications of this failure - the defeat of the British force at Yorktown, were the loss of the American colonies.

Corbett, in *Some Principles of Maritime Strategy*, does explicitly establish the linkage between seapower and the land:

> Since men live upon the land and not upon the sea, great issues between nations at war have always been decided – except in the rarest cases – either by what your army can do against your enemy's territory and national life, or else by the fear of what the fleet makes it possible for your army to do.[57]

However, Corbett in this quotation, arguably, understates the importance of action *at* sea. This is because Corbett emphasises the role of the land environment in attaining strategic effect and the role of maritime forces as, at most, aiding in creating a more favourable situation for ground forces to operate within. This does not explicitly consider the potential strategic impact of decisive action at sea and its influence on the wider politico-strategic situation, including perceptions on the course of the conflict. This resonates with Mahan's analysis of the Yorktown campaign. The Royal Navy was, due to its relative weakness at sea, prevented from providing or enabling support from the sea to the army ashore; it also permitted the provision of French support, both material and political, to the American revolutionary forces.

In marked contrast to Mahan, Corbett emphasises a nuanced, pragmatic approach to the conduct of maritime operations. On the subject of command of the sea, Corbett states:

> It may be that the command of the sea is of so urgent an importance that the army will have to devote itself to assisting the fleet in its special task before it can act directly against the enemy's territory and land forces; on the other hand, it may be that the immediate duty of the fleet will be to forward military action ashore before it is free to devote itself whole-heartedly to the destruction of the enemy's fleets.[58]

[56] Ibid., pp.388-400.
[57] Corbett, *Some Principles*, p.16.
[58] Ibid.

Corbett's flexible mind-set is based on his perspective, particularly influenced by Clausewitz, that force is a means to an ends, the ends being a national policy objective: war being described as 'an exertion of violence to secure a political end which we desire to attain...'[59] Corbett's notion of command of the sea is also more nuanced and relative than that of Mahan: 'Command of the sea, therefore, means nothing but the control of maritime communications, whether for commercial or military purposes'.[60] Furthermore, command of the sea can be general (akin to the Mahanian conception) or local; the latter is significant because, as Corbett elucidates with regard to the nature of maritime communications:

> At sea the communications are, for the most part, common to both belligerents ... The strategical effect is of far-reaching importance, for it means that at sea strategical offence and defence tend to merge ... Since maritime communications are common, we as a rule cannot attack those of the enemy without defending our own.[61]

Corbett cites the example of US strategy against Cuba in the Spanish-American War of 1898 to illustrate the 'evil influence' of pursuing decisive battle as the prerequisite to all other maritime operations. In this example, Corbett highlights that the US possessed 'ample naval force to secure such a local and temporary command of the Gulf of Mexico' as to allow the US to safely undertake an expedition against Cuba and maintain communications with the force once deployed.[62] However, due to the presence of an undefeated Spanish fleet at sea, the US hesitated and nearly failed (for further discussion of a 'fleet in being' see chapter two, pages 64 to 65). In this regard, Corbett is highlighting the merging of the strategic offence and defence. That is, the act of undertaking a strategic offensive (the despatch of an expeditionary force) combined with the defence of that force (protecting its sea lines-of-communication), is sufficient to attain a requisite level of local command vis-à-vis the adversary.

To illustrate a variant of this approach, Corbett cites the example of Japanese maritime operations in the Russo-Japanese War of 1904-1905, where Japan undertook an amphibious operation against Korea despite the presence of an

[59] Ibid., p.30.
[60] Ibid., p.94.
[61] Ibid., p.100.
[62] Ibid., p.103.

undefeated Russian fleet in the theatre of operations.[63] Corbett suggests that the Japanese were content to proceed even though they did not possess sufficient command to cover their entire line of communication but were of sufficiently strength to *deny* the adversary effective control.[64] In this context, the Japanese fleet possessed a degree of local command sufficient to exert (in modern terminology) sea denial, that is, 'the condition short of full *sea control* that exists when an opponent is prevented from using an area of sea for his purposes'.[65]

The term Gorshkov attributes to Soviet naval thinking of the 1930s regarding 'sea dominance' is useful in this regard. This term, 'favourable operational regime' was taken to mean 'the conditions promoting successful solution of the tasks set before the fleet'.[66] This notion of creating a favourable operational regime follows in a similar vein to Corbett's thinking and stresses the use of seapower as a means to achieving a certain ends. Regarding Soviet naval thinking, Gorshkov stated:

> It always saw the gaining of dominance at sea not as an end in itself but merely a way of creating certain conditions enabling the forces and resources of the fleet to solve successfully particular tasks in specific areas of the theatre in a defined period of time.[67]

The definition of maritime communications forwarded by Corbett, and the Soviet notion of a favourable operational regime, focuses on the notion of attaining control of maritime communications to enable the exploitation of those communications for another purpose. Corbett put it thus:

> Naval warfare does not begin and end with the destruction of the enemy's battle-fleet, nor even with breaking his cruiser power ... We are concerned with the exercise of command. We are *using* the sea, or interfering with its use by the enemy...[68]

This highlights the key difference between the narrower, Mahanian naval perspective vis-à-vis the maritime perspective of Corbett. Mahan's emphasis is on fighting the enemy at sea and destroying his shipping; securing command of the sea is the ends for Mahanian naval strategy, the purpose of which is the expansion

[63] Ibid., p.104.
[64] Ibid.
[65] *British Maritime Doctrine* (BR1806), p.289.
[66] Gorshkov, *Sea Power of the State*, p.231.
[67] Ibid.
[68] Corbett, *Some Principles*, p.233. Emphasis added.

of a state's power at sea.[69] In contrast, Corbett emphasises using the sea as a means to an end. This focuses on securing and exploiting control of maritime communications as a means by which to influence the wider military-strategic situation.

To an extent, the differences between Mahan and Corbett are, an issue of emphasis. As Till states:

> It is important, however, not to exaggerate the extent of Corbett's scepticism about 'command of the sea' and 'decisive battle'. He acknowledged that the concerted pursuit of these two central objectives of 'Mahanian' maritime strategy was usually valid. It was only his willingness to say that sometimes it might not be that got him into trouble...[70]

The trouble Till refers to was a significant disagreement with Corbett's perspective on the importance of attaining command through battle from some quarters within the Admiralty. In this regard, Till cites the note inserted by the Admiralty Board into the final volume of Corbett's account of the Battle of Jutland in the semi-official *History of the First World War* stating:

> Their Lordships find that some of the principles advocated in the book, especially the tendency to minimise the importance of seeking battle and of forcing it to a conclusion, are directly in conflict with their views.[71]

This difference is based on Corbett's aforementioned flexible mind-set and emphasis on the maritime dimension of warfare, whereby naval strategy is considered alongside land strategy in the context of the political aims determining the application of force. Corbett defined naval strategy as '... that part of it which determines the movements of the fleet when maritime strategy has determined what part the fleet must play in relation to the action of the land forces...'; and maritime strategy itself is defined succinctly as 'the principles which govern a war in which the sea is a substantial factor'.[72] The consideration of sea- and land power together and in the context of wider policy aims is significant for as Major General Sir Charles Callwell elucidated:

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[69] Mahan, *Influence of Sea Power*, p.23.
[70] Till, *Seapower*, p.62.
[71] Till, 'Richmond and the Faith Reaffirmed: British Naval Thinking between the Wars' in Till (ed.), *The Development of British Thinking*, pp.103-133, quotation, p.114.
[72] Corbett, *Some Principles*, p.15.

> There is an intimate connection between command of the sea and control of the shore. But if the strategical principles involved in this connection are to be put in force to their full extent, if the whole of the machinery is to be set in motion, there must be co-ordination of authority and there must be harmony in the council chambers and in the theatre of operations...[73]

This relates back to Smith's definition of the utility of force and his emphasis on understanding the context, target and intended result regarding its use. Corbett said in this regard; 'In short, the Staff must ask of them [Ministers of State] what is the policy which your diplomacy is pursuing, and where, and why, do you expect it to break down and force you to take up arms?'[74] As discussed in the preceding section, seapower constitutes a distinct entity within the broader configuration of national power, encompassing the maritime elements of the economic and military instruments of power. Thus, the strategic application of seapower broadly defined ideally requires coordination at the national political level. The military application of seapower, that is, the conduct of naval and or wider maritime operations, could be coordinated at the lower military operational level for the purposes of a particular campaign or operation, albeit with an eye on the national policy level. In this context, Corbett explained:

> We require for the guidance of our naval policy and naval action something of wider vision than the current conception of naval strategy, something that will keep before our eyes not merely the enemy's fleets or the great routes of commerce, or the command of the sea, but also the relations of naval policy and action to the whole area of diplomatic and military effort.[75]

That is, *a* Maritime Strategy. The relationship between naval strategy and a maritime strategy can be explained using Corbett's differentiation between minor and major strategy. Minor strategy thus:

> ... Has for its province the plans of operations. It deals with - (1) The selection of the "objectives", that is, the particular forces of the enemy or the strategical points to be dealt with in order to secure the object of the particular operation. (2) The directing of the force assigned for the operation.[76]

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[73] Major General Sir Charles Callwell, *Military Operations and Maritime Preponderance: Their Relation and Interdependence* (Annapolis: Naval Institute Press, 1996) cited in Till, 'Corbett and the Emergence of a British School?' p.73.
[74] Corbett, *Some Principles*, p.18.
[75] Sir Julian Corbett, *England in the Seven Years' War: A Study in Combined Strategy*, Volume 1, (Cambridge: Cambridge University Press, 2010) [reprint of the original Longmans, Green, and Co. 1907 edition], p.5.
[76] Corbett, *Some Principles*, p. 308. This quotation is from the 'Green Pamphlet' – 'Strategical Terms and Definitions used in Lectures on Naval History' and was issued to students attending

Minor strategy can be naval (the objective is to be attained by the fleet); military (to be attained by the army); or combined (army and navy operating jointly). In contrast, major strategy:

> In its broadest sense has also to deal with the whole resources of the nation for war. It is a branch of statesmanship. It regards the Army and Navy as parts of one force, to be handled together; they are instruments of war. But it also has to keep in view constantly the politico-diplomatic position of the country (on which depends the effective action of the instrument), and its commercial and financial position (by which the energy for working the instrument is maintained).[77]

This distinction is of major importance, in particular with regard to the defining and formulation of a maritime strategy. The above definition of minor strategy places it, within the levels of war, between the operational[78] and military-strategic[79] levels due to its focus on the objective(s) and planning of an operation and the direction of the force assigned to it. Thus, although Corbett refers to minor strategy as being potentially combined (or joint, to use the modern lexicon), this would not be a maritime strategy *per se*, but would rather be a strategy concerning the employment of maritime forces alongside other military forces. This is because a Maritime Strategy is defined in the context of relating the application of military force, alongside the other instruments of state power, to national policy. This is the domain of major strategy. The aim of minor strategy is to attain an 'immediate object' which are 'the ends of particular operations or movements' and contribute to the attainment of ulterior objectives;[80] the attainment of ulterior objects (the overall objective) is the aim of major strategy. Proceeding from this, major strategy is to an extent, equivalent to the national military strategy of a state. This was defined in *British Defence Doctrine* as:

> Strategy is particularly concerned with the political consequences and advantages of the threat and use of force; it gives meaning and context to all operational and tactical actions. Its purpose is to balance the ways and means required to achieve stipulated ends, conditioned by the environment and prospective opponents. Military strategy links political aspiration, expressed in Government policy, and

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Corbett's lectures at the Royal Naval War College before the First World War. See ibid., pp.305-306 for Professor Eric Grove's note on the pamphlet, and pp.307-345 for the pamphlet itself.

[77] Ibid.

[78] Defined as 'the level at which campaigns are planned, conducted and sustained, to accomplish strategic objectives and synchronize action, within theatres or areas of operation'. MoD (UK), *British Defence Doctrine* (JDP 0-01), Third Edition, 2008, p.38.

[79] Defined as being 'concerned with the allocation, prioritization and balancing of military resources between concurrent and competing operational demands'. Ibid., p.15.

[80] Corbett, *Some Principles*, p.307.

> military feasibility. It is derived from national strategy and determines how the Armed Forces should be configured and employed, in conjunction with the other instruments of national power, to achieve favourable outcomes.[81]

Rear Admiral Raja Menon, proceeding from Corbett's definition of major strategy, states with regard to defining a Maritime Strategy: 'we may conclude that the benchmark of acceptance for any maritime strategy is that it must affect the national political purpose'.[82] Using this quotation and the above definitions of national military strategy and major strategy, a Maritime Strategy can be defined as a maritime approach to national military strategy. This is because the definition of military strategy in *British Defence Doctrine*, in particular with regard to the point '[military strategy] is derived from national strategy and determines how the Armed Forces should be configured and employed, in conjunction with the other instruments of national power...', corresponds with the parameters of maritime strategy. That is, both focus on the role and application of the armed forces as a single instrument, alongside the other instruments of power and in relation to the national policy goals of the state. Further, both national military strategy and Corbett's approach to maritime strategy are concerned with the allocation, prioritisation and balancing of military resources. In this regard, Corbett states:

> ... Embracing them [naval and minor military strategy] both is a larger strategy which regards the fleet and army as one weapon, which co-ordinates their action, and indicates the lines on which each must move to realise the full power of both. It will direct us to assign to each its proper function in a plan of war; it will enable each service to realise the better the limitations and the possibilities of the function with which it is charged, and how and when its own necessities must give way to a higher or more pressing need of the other.[83]

This constitutes the basis for a Corbettian maritime strategy, and effectively equates a Maritime Strategy to national military strategy. Thus, a Maritime Strategy constitutes more than the strategic application of seapower: it serves as the basis for a distinct approach to the development and employment of a state's armed forces. This does not mean that *naval* power would constitute the core determinant of a state's military power; Corbett stresses that the land constitutes the ultimate deciding point of conflict; rather, a Maritime Strategy would use the attributes of seapower and the maritime capabilities of the state, as the major

[81] MoD (UK), *British Defence Doctrine*, p.15.
[82] Menon, *Maritime Strategy and Continental Wars*, p.23.
[83] Corbett, *Some Principles,* pp.10-11.

shaping influence on its wider military posture. This is in contrast to 'maritime strategy' which focuses on the utilisation of maritime forces *alongside* military strategy and air strategy. Further, this conception of a maritime strategy, in particular with regard to 'each must move to realise the full power of both' provides the context for referring to the role of the other services in contributing to the development and enhancement of seapower; what Till refers to as 'seapower by other means'.[84] For example, the maritime geography of a state – a constituent of seapower - could be significantly influenced via the advance or retreat of its army; the impact of the collapse of the Soviet Union on Russian access to particularly the Baltic and Black Seas is indicative of this.

From the preceding discussion, it is however also discernible that the term 'maritime strategy', as alluded to in the introduction to this section, can be used to convey different meanings. Table one provides a brief summary of the three principal military uses of 'maritime strategy'. Till includes in his constituents of seapower, a state's civilian maritime capabilities and commercial operations;[85] it would thus be possible to conceive of a civilian 'maritime economic strategy' relating national economic policy objectives to maritime industrial and commercial means.

The applicability of a maritime strategy is not limited to only those states that would be commonly defined as 'maritime'; as the aforementioned quotation from Admiral Sir Cyprian Bridge states, most maritime states are also continental. Thus, could a basically land-oriented state have a maritime strategy? Russia, traditionally perceived as a continental power, provides an example of a state with maritime strategy-based influences at the service, operational, military strategic and, to an extent, grand strategic levels. Russia has a grand strategic level maritime doctrine; naval development is increasingly set in a broader maritime context; wider military strategy incorporates some maritime influences (in particular concerning naval and air force strategic aviation cooperation); and the increasing importance of the Arctic to Russian national policy is significantly

[84] Till, *Seapower*, pp.106-112.
[85] Ibid., p.21, figure 2.1.

based on maritime interests.[86] However, despite the naval component accounting for 40 per cent of the total defence budget,[87] Russia does not have a Maritime Strategy as the maritime dimension does not constitute the determining factor in Russian grand strategy.

Uses of 'Maritime Strategy'	Description	Example
Military Strategic level 'maritime strategy'	The utilisation of the attributes of seapower and the maritime capabilities of the state as a major shaping influence on the development and employment of its armed forces.	The Corbettian conception of maritime strategy (*Some Principles of Maritime Strategy*, pp.10-11)
Operational level 'maritime strategy'	The utilisation of a maritime approach to the planning and conduct of a campaign or major operation.	*Operation Corporate*: the British campaign to liberate its South Atlantic territories in 1982.
Service-level 'maritime strategy'	The utilisation of a maritime approach to the defining and formulation of an individual armed service's strategy for development and employment.	Contemporary British Naval Service strategy as expressed in *British Maritime Doctrine*.

Table 1. The Uses of 'Maritime Strategy'

Finally, the possession of significant maritime forces does not inherently mean the state will have a Maritime Strategy. It may be that the overarching national policy objectives of the state, including non-military factors such as diplomatic considerations, point to an alternative military strategic approach. For example, despite possessing a maritime preponderance, the Allies in the First World War were guided by a continental strategy focusing on the Western Front as the principal area for military operations against Imperial Germany.[88] This is not to say that the Allies did not utilise maritime strategy for the development, deployment and employment of their maritime forces but that the principal shaping influence on the conduct of the war as a whole was land-centric.

[86] James Bosbotinis, 'The Russian Federation Navy: An Assessment of its Strategic Setting, Doctrine and Prospects', *Special Series* (Research and Assessment Branch: Defence Academy of the United Kingdom), 10/10 (September 2010).
[87] Ibid., p.32.
[88] Menon, *Maritime Strategy and Continental Wars*, pp.59-61.

In order to conclude this section, a definition of maritime strategy is required. At the start of this section, a working definition was suggested combining the meanings of the two component parts; maritime being 'of the sea' and strategy being, as suggested by Liddell Hart, 'The art of distributing and applying military means to fulfil the ends of policy'. The subsequent examination of the literature on maritime strategy has endeavoured to convey the debate on what constitutes maritime strategy; in particular whether to conceive of it in a narrower naval sense or broader maritime sense. Further, maritime strategy can be defined at differing levels within the hierarchy of strategy and the levels of war. However, Corbett, although analysing the various facets of naval and maritime operations, the role of strategy in relation to policy and differentiating between the levels of strategy and their relation to the strategic requirements of a maritime power, does offer a fundamentally clear and concise definition of maritime strategy: 'By maritime strategy we mean the principles which govern a war in which the sea is a substantial factor'.[89] For the purposes of this thesis, the utility of a maritime approach to British national military strategy (that is, maritime strategy at the military-strategic level) is the principal focus for analysis.

National Policy, Grand Strategy and Seapower

A core tenet of the literature on maritime strategy and one emphasised in the preceding discussion, is the importance of national policy in the development of maritime strategy. This is to provide an overarching context for the formulation of strategy and ensure that the employment of armed force is consciously related to the attainment of defined national policy objectives. National policy provides the rationale for employing force, as Smith states:

> Military force when employed has only two immediate effects: it kills people and destroys things. Whether or not this death and destruction serve to achieve the *overarching or political purpose* the force was intended to achieve depends on the choice of targets or objectives, all within the broader context of the operation. That is the true measure of its utility.[90]

Commodore Steve Jermy, Royal Navy (retired), a former Strategy Director at the British Embassy in Kabul, Afghanistan, suggests the following definition of policy:

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[89] Corbett, *Some Principles*, p.15.
[90] Smith, *Utility of Force,* p.6. Emphasis added.

> A government's (or an organization's) formed position on an issue, situation or problem, including what political objective the government seeks to achieve, what resources it is prepared to commit to the pursuit of that objective and what course of action it intends to follow... policy is how a government approaches an issue in terms of *ways*, *ends* and *means*... strategy is the *ways* component of that policy...What *ways* should we employ to deliver the *ends* that our policy seeks within the *means* that our policy has allocated?[91]

This definition is valuable as it provides a framework within which the links between national policy, grand strategy and (an) instrument(s) of state power (for example, seapower) can be understood. It also indicates the importance of the political dimension to the formulation of strategy; that is, foreign policy provides the aims and trajectory from which the requirements and objectives for defence policy and strategy are deduced.[92]

In this regard, Castex suggests the following questions for relating the formulation of strategy to the foreign and wider national policy objectives of the state:

> What are France's interests? What is the best direction in which to focus French effort? How should we pursue our historic development and the work of our predecessors? Where should we struggle for profit, to improve the present situation? Where, on the other hand, should we resist to conserve what we have? Whence are the mostly dangerous threats likely to come? To what attacks are we particularly exposed? What should we do to meet our needs, be they positive or negative, expansionist or conservative? What specific plans stem from these needs? What are the appropriate *political, military, maritime, colonial, economic, moral*, etc., plans for the situation?[93]

This quotation is significant as it seeks to link fundamental national policy objectives (what is/are the national interest(s)?), political, economic and military strategic factors and the formulation of specific plans of action deriving from the answers to the preceding questions. Castex seeks to establish the framework within which core national objectives and the means to attain them can be identified and favourable outcomes achieved.

The importance of the link between the political dimension and the use of the force is explained by Edward Luttwak in *The Political Uses of Sea Power*:

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[91] Steven Jermy, *Strategy for Action: Using Force Wisely in the 21st Century* (London: Knightstone Publishing Ltd, 2011), p.18.
[92] Interview with Commodore Steve Jermy, London, 9 March 2011. See also Till, *Seapower*, p.21, figure 2.1 for a diagrammatic articulation of the setting for seapower in the context of the wider policy-strategy relationship.
[93] Castex, *Theories Strategiques*, pp.252-253. Emphasis added. For contemporary circumstances, perhaps 'colonial' factors should be replaced with 'alliance'.

> It is only a continuous re-evaluation of the political goals pursued which can make warfare a rational activity, in the formal sense of *ends-means alignment*; and second, that if the political dimension of war is not accorded an overriding priority, the use of force will often be ineffectual, and may even be perverted to the advantage of the very enemy against whom force was applied in the first place.[94]

The importance of the political dimension is even more pronounced with regard to the application of limited force in contingencies other than, or short of war. Sir James Cable, a former British diplomat and a leading maritime strategic thinker of the late 20th century, emphasises the difference between the use of force as an act of war and the use of *limited* force as an element of coercive diplomacy. An act of war is defined as:

> ... The use of armed force against or in a foreign state for the primary purpose of injuring that state, whether as part of an existing policy of injuring the other state as and when opportunity serves, or to initiate such a policy, or and this is a new and important point, without regard to the risk that the reaction of the victim state will go beyond mere self-defence to a reciprocal adoption of injury rather than profit as the prime motive for policy.[95]

In contrast, Cable defines an act of coercive diplomacy as:

> Intended to secure some specific advantage from another state and forfeits its diplomatic character if it either contemplates the infliction of injury unrelated to obtaining that advantage or results in the victim attempting the infliction of injury after the original objective has been either achieved or abandoned. *Coercive diplomacy is thus an alternative to war* and, if it leads to war, we must not only hold that it has failed: we may even doubt whether it ever deserved that name.[96]

That is, coercive diplomacy is an avowedly limited use of force for limited specific objectives. This is put into the maritime context by Cable as the basis for his definition of gunboat diplomacy:

> Gunboat diplomacy is the use or threat of limited naval force, otherwise than as an act of war, in order to secure advantage or to avert loss, either in the furtherance of an international dispute or else against foreign nationals within the territory or the jurisdiction of their own state.[97]

Cable explicitly defines limited naval force as being a political instrument: 'The purpose ... is to consider ... applications of limited naval force as one of the

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[94] Luttwak, p.53. Emphasis added.
[95] James Cable, *Gunboat Diplomacy, 1919-1991: Political Applications of Limited Naval Force*, Third Edition (Basingstoke: Macmillan, 1994), p.12.
[96] Ibid., pp.12-13. Emphasis added.
[97] Ibid., p.14.

instruments of foreign policy'.[98] In this context, the elucidation of a clear political objective is particularly important as the use of force is being contemplated, not as a component of a state's military strategy but as an element of its foreign policy.

Smith suggests in a similar vein:

> Without an aim firmly linked to the political purpose it is difficult to use force to advantage, *because the commander does not know what outcome or effect must be achieved in order to support the achievement of the overall political purpose*.[99]

The determining of outcomes is, as Corbett stated 'questions which lie in the lap of Ministers charged with the foreign policy of the country',[100] that is, national policy provides the rationale for the use of force – it provides the aim governing the application of force. The aim provides the basis from which to derive objectives at the strategic level, from which operational and tactical objectives are developed.

This was alluded to by Corbett in his definition of major strategy, where he refers to the 'politico-diplomatic position of the country (*on which depends the effective action of the instrument*)'. In the preceding discussion, major strategy was considered in the context of the defining and placing of maritime strategy within the hierarchy of strategy. However, in his definition of major strategy, Corbett describes it as being, in its broadest terms, concerned with the whole resources of the state for war and a branch of statesmanship. This links major strategy to the concept of grand strategy. Professor Edward Mead Earle (1894-1954), principally associated with the Institute for Advanced Study at Princeton University,[101] defined the latter as:

> Strategy, therefore, is not merely a conception of wartime, but is an inherent element of statecraft at all times ... In the present-day world, then, strategy is the art of controlling and utilizing the resources of a nation – or a coalition of nations – including its armed forces, to the end that its vital interests should be effectively promoted and secured against enemies, actual, potential, or merely presumed. The highest form of strategy – sometimes called grand strategy – is that which so

[98] Ibid., p.1.
[99] Smith, *Utility of Force*, p.12. Emphasis added.
[100] Corbett, *Some Principles*, p.18. Emphasis added.
[101] Biography of Dr Edward Mead Earle, http://findingaids.princeton.edu/collections/MC020/#summary. Accessed 9 September 2013.

> integrates the policies and armaments of the nation that resort to war is either rendered unnecessary or is undertaken with the maximum chance of victory.[102]

The concept of grand strategy is interesting as it contains synergies with ideas developed by both Mahan and Corbett, including for example; the former's six principles influencing a state's seapower (encompassing the resources of a nation); and the latter's thinking on the nature of strategy and the links between policy and strategy (in particular regarding major strategy). In addition, Till suggests 'Seapower is clearly a larger concept than landpower or airpower, neither of which encompasses the geo-economic dimensions of human activity to the extent that seapower does'[103]. As discussed in the preceding sections, Mahan, Gorshkov and Till stress the economic basis for seapower, and Corbett in his definition of major strategy refers to the 'commercial and financial position' of the state 'by which the energy for working the instrument [the armed forces] is maintained'. This points to a potential synergy with grand strategy.

Professor Sir Hew Strachan, Chichele Professor of the History of War at Oxford University, with regard to Mahan's concept of seapower, refers to 'a symbiotic link between sea power, liberal democracy and ideas of grand strategy. All three elements seemed to have been required to achieve synergy...'[104] The reference to liberal democracy warrants further discussion. As defined by Mahan, the character of the people constitutes a key component of seapower and thus the style of government of the state itself constitutes a potentially critically factor in the development of seapower. Till summarises the argument thus:

> Seafaring and trade produce merchants. Merchants accumulate wealth and political power in order to defend and develop it. Often they will prevail in government, and enforce their ideas on others. These are the ideas that encouraged trade in the first place: freedom of information and therefore of opinion, open and responsive government, fair taxation, social enterprise – all the liberal values so familiar today.[105]

Till adds, citing Professor Nicholas Rodger, Senior Research Fellow at All Soul's College, Oxford;

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[102] Edward Mead Earle, 'Introduction' in Edward Mead Earle (ed.), *Makers of Modern Strategy: Military Thought from Machiavelli to Hitler* (Princeton: Princeton University Press, 1971), p.viii.
[103] Till, *Seapower*, p.33.
[104] Hew Strachan, 'The Lost Meaning of Strategy', *Survival*, Vol.47, No.3 (August 2005), pp.33-54.
[105] Till, *Seapower*, p.36.

> Navies need consensus because they require the maximum involvement of seafarers, shipowners, urban merchants, financiers and investors. Autocracies manage armies well enough, because that is much more a matter of simply mobilising manpower and the equipment it needs.[106]

However, Till also highlights two caveats:

> ... It seems not so much to be a question of whether government and society are democratic and libertarian, as to whether they are efficient. Mahan himself, no great democrat, was worried that government by the people for the people would rather spend its money on things other than defence ... Moreover, some of the most effective navies in history have emerged from countries and regimes hardly noted for their adherence to democratic principles ... The German *Kriegsmarine* of the Second World War ... was highly committed and, given its circumstances, very effective even though it operated in perhaps the most barbarous of all modern dictatorships.[107]

Till concludes by stating:

> To summarise, it is not liberalism and democratic principles in themselves that were, and are, decisive in the long-term development of seapower, but rather administrative efficiency in raising money and other resources, and in spending it wisely. But, as a very general rule, these qualities do seem to have been particularly associated with freer, stable, more mercantile-styles of society and government.[108]

In this context, the relationship that Strachan describes between seapower, liberal democracy and grand strategy can be deduced: that is, seapower requires a system of governance that is administratively efficient and conducive to the development of trade and a wider maritime community (the associated land-based support structures, for example, shipowners, insurance, etc.).[109] Furthermore, seapower is not restricted to one component of a state's power – it is a factor in the three principal instruments – economic, military and politico-diplomatic – thus its effective utilisation is arguably inherently synergistic with the comprehensive approach to the use of state power covered by grand strategy. This is not to equate seapower to grand strategy. Seapower is a holistic conception of the state's ability to exploit the sea as a means toward the attainment of national objectives; whereas grand strategy seeks to control and utilise the whole range of the instruments of state power to fulfil national objectives.

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[106] Ibid.
[107] Ibid., p.85.
[108] Ibid., pp.85-86.
[109] See ibid., pp.84-88.

The relationship between grand strategy and seapower can be interpreted using the general parameters of the minor-major strategy relationship as elucidated by Corbett. That is, minor strategy is concerned with the planning of operations, the selection of objectives and the direction of the assigned force; and major strategy is concerned with the national-level primary objective and selection of the force to be utilised. In the context of the seapower-grand strategy synergy, seapower could be viewed as a form of minor strategy, concerned with the 'operationalising' of a state's maritime capabilities (or an aspect thereof); whilst grand strategy would be concerned with the national objective and the selection of the instrument of power to be utilised (or combination thereof). This would thus enable, for example, the political application of seapower to be analysed vis-à-vis a grand strategic objective. In essence, the maritime capabilities encompassed by seapower provide 'ways', grand strategy sets the desired 'ends' derived from national policy, from which the 'means' can be selected. In the context of the military application of seapower, the preceding discussion of maritime strategy indicates a potential means (thereby linking the ways and ends).

The concept of a 'British Way in Warfare' provides an example of the conceived application of seapower at the grand strategic level. Captain Sir Basil Liddell Hart developed the 'British Way in Warfare' as a generalised approach to British grand strategy based on his reading of history from the Elizabethan period. This was first promulgated in an address to the Royal United Services Institute in 1931[110] and subsequently published in a book entitled *The British Way in Warfare*.[111] Liddell Hart defined the British approach to warfare on the basis of:

> Our historic practice, as we have seen, was based on economic pressure exercised through sea-power. This naval body had two arms; one financial, which embraced the subsidising and military provisioning of allies; the other military, which embraced sea-borne expeditions against the enemy's vulnerable extremities.[112]

The application of seapower forms the core principle of Liddell Hart's concept of the 'British Way in Warfare'. Till summarises Liddell Hart's concept and this points to the influence of seapower:

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[110] Basil Liddell Hart, 'Economic Pressure or Continental Victories', *RUSI Journal*, Vol.76, No.503 (1931), pp.486-510.
[111] Basil Liddell Hart, *The British Way in Warfare* (London: Faber, 1932)
[112] Liddell Hart, 'Economic Pressure or Continental Victories'.

- The importance of securing command of the sea;
- The effectiveness of sea-based economic pressure;
- The need to avoid Continental commitments while securing the aid of allied landpowers;
- Generous expenditure on the Navy;
- A focus on maritime areas of operation;
- Developing synergy between the Army and the Navy;
- The value of expeditionary operations;
- Limited, modest objectives, cost-effectively sustainable;
- The need to project power ashore.[113]

This approach combined the utilisation of the economic power, a military strategy focusing on maritime power projection, and the securing of allies to undertake continental operations, that is, the use of the politico-diplomatic instrument. Liddell Hart was motivated to develop the notion of a 'British Way in Warfare' emphasising a maritime strategic approach as an alternative to continental operations due to his opposition to mass mobilisation and the slaughter of the Western Front in the First World War.[114] However, David French, an eminent British military historian, in *The British Way in Warfare 1688-2000* demonstrates that contrary to Liddell Hart's analysis, the continental commitment of the First World War did not mark a significant departure for British strategy; Britain had been substantially engaged in Europe since the late 17th century and by virtue of the Indian Empire was *also* a continental power.[115] Conversely, an alternative to the 'British Way in Warfare' advocated by G. S. Graham, Professor Sir Michael Howard and Professor Paul Kennedy, combining elements of the maritime case and a recognition of the weakness of naval power operating in isolation against a continental power, termed by French the 'mixed paradigm'[116] did not constitute a more appropriate conception of British strategy. French suggests thus:

> Throughout the period examined by this book [1688-1989] British policy-makers did not *consistently* prefer isolation to engagement in Europe in peacetime nor in wartime did they *consistently* adopt either the "British way in warfare" or the mixed paradigm outlined in the Introduction.[117]

The concept of a 'British Way in Warfare' is nonetheless valuable as it provides a framework within which to analyse the interaction of seapower and maritime strategy at the grand strategic level. It also, by broaching the question of a 'British

[113] Till, 'Richmond and the Faith Reaffirmed', p.109.
[114] I am grateful to Professor Andrew Lambert for this insight.
[115] David French, *The British Way in Warfare 1688-2000* (London: Unwin Hyman, 1990), p.151.
[116] Ibid., p.xvi.
[117] Ibid., p.225. Emphasis added.

Way in Warfare', establishes the basis from which the particular influence and implications of national strategic culture and perspective can be incorporated into the analysis of strategy. Correlli Barnett, a former keeper of the Churchill Archives and military historian, suggests that national power and the constituents of 'total strategy':

> ... By no means consists only in its armed forces, but also in its economic and technological resources; in the dexterity, foresight and resolution with which its foreign policy is conducted; in the efficiency of its social and political skills, energy, ambition, discipline, initiative; *their beliefs, myths and illusions*... [and] the way all these factors are related to one another ... National power has to be considered not only in itself ... but relative to the state's foreign or imperial obligations ... relative to the power of other states.[118]

This quotation includes reference to the aforementioned importance of economic factors and foreign policy alongside the military instrument in the composition of state power but also significantly, refers explicitly to the relevance of 'beliefs, myths and illusions'. This adds a valuable component to the analysis of strategy; that is, an enhanced understanding of the specific national context within which strategy development is undertaken. Professor Colin Gray, Director of the Centre for Strategic Studies at the University of Reading, states with regard to the interaction of sea, land and air power at the grand strategic level:

> Sea power, land power, and air power are partners rather than foes. Each needs the others if success in war is to be achieved. And *they are always specific to country, strategic context, and tactical feasibility*. Sea power ever is about the performance of particular missions in particular places with an actual quantity and quality of force and ancillary services, in face of a particular enemy.[119]

In this regard, the value of examining the connection between national policy, grand strategy and seapower is to establish the context within which maritime force functions, and contributes toward the attainment of national objectives. From this, the utility of maritime force can be assessed, thus aiding in the design and formulation of potential maritime strategies in light of the specific factors pertaining to 'country, [and] strategic context'.

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[118] Correlli Barnett, *The Collapse of British Power* (London: Pan Books, 2002), p.xv.
[119] Colin Gray, 'The Leverage of Sea Power' in Eric Grove and Peter Hore (eds.) *Dimensions of Sea Power: Strategic Choice in the Modern World* (Hull: University of Hull Press, 1998), pp.32-45, quotation, p.35. Emphasis added.

The Utility of Maritime Force

In seeking to define the concept of 'the utility of maritime force', one is posing the question: what value do armed forces operating at or from the sea have in terms of contributing toward the attainment of national political objectives? This question is intended to be applicable in a general sense and not limited to an evaluation of a potential maritime strategy, but would also be applicable to a discussion of the role of maritime forces in a land-centric approach. The overarching approach to the defining of this concept is influenced by Smith's approach to the general utility of force (see the introduction to this chapter). This is based on the understanding of the following parameters: Context: why are we acting? Objective: what do we seek to achieve? Target: Whom do we wish to influence? Nature of the force: what are the available means / how are we to attain the objective?

The foundation deriving from the above set of parameters can be further developed with the use of Jermy's concept of the 'Strategic Estimate'. This is derived from the Commander's Estimate - 'a set of structured questions used by a commander and his staff to add rigour to the command team's thinking when confronted with an operational or tactical situation'.[120] Jermy has utilised this approach to tactical and operational level decision making as the basis of a structure for strategic analysis and strategy making.[121] The 'Strategic Estimate' is based on seven questions intended to 'help structure an iterative analysis and debate';[122]

1. What is the overarching political context?
2. What is the political issue (or issues) at contest?
3. What is the political objective and why?
4. What are the resources available?
5. What courses of action could we adopt?
6. What course of action should we adopt?
7. What should be the spirit of our approach?[123]

The 'Strategic Estimate' therefore provides the means to approach the analysis and formulation of strategy in a manner that addresses the need to understand the context, objective, target and nature of the force as the basis for applying force

[120] Jermy, *Strategy for Action*, pp.192-193.
[121] Ibid., p.197.
[122] Ibid., p.198.
[123] Ibid.

with utility. Thus, in order to determine the utility of maritime force, one is concerned with the ends, ways and means governing its development, deployment and employment. The framework for this ends-ways-means analysis is provided by the interaction of grand strategy, maritime strategy and seapower. This triad provides the components corresponding to the aforementioned parameters for determining the utility of maritime force. Grand strategy provides the context and objective for action; it sets the desired ends. Maritime strategy, constituting the military-strategic application of seapower, provides potential ways to attain the objective. Seapower, encompassing the maritime (military and civilian) capabilities of the state, provides the potential means by which to attain the defined grand strategic objective.

This latter point would appear to contradict the previously cited quote from Till: '... This approach defines seapower in terms of its consequences, its outputs not the inputs, the ends not the means'.[124] However, the two points are compatible. This is because the former point, although stating seapower provides a means, it is one based on the *output* and *consequences* of the application of seapower toward the attainment of a defined ends.

By examining the nexus of grand strategy, maritime strategy and seapower, in particular with regard to how the application of maritime capabilities serves national objectives, an increased insight into the functioning of maritime power should be discernible. In addition, by shifting the analysis from how maritime capabilities contribute toward the attainment of grand strategic objectives, to how the defining of grand strategy shapes the generation of maritime power, further insight into the utility of maritime force should be garnered. The method by which to examine the utility of maritime force can be developed via two broad approaches. First, via a 'bottom-up' maritime capability-based approach that asks how and by what means does seapower and maritime strategy contribute to grand strategy? Or, secondly via a 'top-down' approach that considers the grand strategic level and its implications for, and influence on, seapower and maritime strategy and examines why maritime force would be of potential utility.

[124] Till, *Seapower*, p.21.

The above method addresses the context, objective and nature of the force and to an extent can be undertaken using theory derived from the literature. However, the analysis of the target, in particular with regard to how it responds to maritime force, requires analysis based on the use of historical precedent. For example, Menon utilises case histories as part of his analysis into the role and utility of maritime strategy vis-à-vis continental powers.[125] This is because as Professor Andrew Lambert, Laughton Professor of Naval History at King's College London, states (albeit in the context of the development of naval education):

> .... Only history could contribute hard evidence to the process ... In the absence of personal experience the only way to learn the business of modern war was to profit from the experience of others, in earlier ages and other navies.[126]

In the 'Green Pamphlet', Corbett refers to the use of deductive and inductive evidence. Deductive evidence is defined as analysing the meaning of a term; for example, Corbett asks, 'We say the aim of Naval Strategy is to get command of the sea. What does this mean?'[127] In contrast, inductive evidence is defined as being 'from history or past experience'.[128] Mahan also based his analysis of seapower on the study and use of history:

> A study of the military history of the past ... is enjoined by great military leaders as essential to correct ideas and to the skilful conduct of war in the future ... while many of the conditions of war vary from age to age with the progress of weapons, there are certain teachings in the school of history which remain constant, and ... can be elevated to the rank of general principles. For the same reason the study of the sea history of the past will be found instructive, by its illustration of the general principles of maritime war...[129]

The value of the consideration of historical experience alongside the examination of theory is succinctly described by Till:

> Sometimes, after all, theoretical conceptions (about the protection of shipping for example) only become clear when they are 'realised' or put into practice in training, procurement or the conduct of operations. Naval theory and practice, past and present, can have a relationship that is truly symbiotic.[130]

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[125] See Menon, *Maritime Strategy and Continental Wars*, pp.48-63.
[126] Lambert, 'The Development of Education in the Royal Navy', p.47.
[127] Corbett, *Some Principles*, p.316.
[128] Ibid. p.317.
[129] Mahan, *Influence of Sea Power*, pp.1-2.
[130] Geoffrey Till, 'Introduction: British Naval Thinking: a Contradiction in Terms?' in Till (ed.), *The Development of British Naval Thinking*, pp.1-18, quotation, p.11.

Further, and deriving from the use of history as a means of studying the utility of maritime force, the analysis of the development of thinking concerning the role and utility of seapower and maritime strategy in their strategic context is important. This is especially so with regard to the development of doctrine (the evolution of contemporary British maritime doctrine is examined in the following chapter), which Till defines as 'the application of maritime theory in a particular time and place'.[131] This enables the perceived utility of maritime force to be examined via the analysis of the particular context of a national application of seapower. Rear Admiral Richard Hill, Royal Navy (retired) and formerly editor of *The Naval Review*, in effect asks this question in the context of reviewing British naval thinking in the Cold War:

> *What* did seapower consist of in the nuclear age: were the classical constituents still valid, and what elements if any had to be added? *Why* was seapower (and naval power in particular) important, desirable or necessary? ... If so, *how* was it to be exercised? And, in a Britain whose relative economic position was declining, was the *wherewithal* achievable?[132]

Within this passage, the questions of 'why was seapower important, desirable or necessary' and 'how was it to be exercised' are of most importance with regard to determining the utility of maritime force, and contribute toward the answering of Hill's last question concerning whether the wherewithal is achievable. This is because, by determining the utility of maritime force, its value within the broader context of national power and, importantly, national budgetary priorities, can be better assessed. This emphasises a valuable aspect of the study of maritime thinking, that is, as Till suggests 'it may be intended to help others understand the role of naval power, past, present and future'.[133] The above set of questions posed by Hill also illustrates the basic constituents of a 'bottom-up' approach to the analysis of the utility of maritime force.

In contrast, the 'top-down' approach which considers the grand strategic level and how it influences the trajectory and development of the instruments of national power, would pose questions focusing on particularly foreign and defence policy objectives and how those shape the overall requirements for national military

[131] Ibid.
[132] Richard Hill, 'British Naval Thinking in the Nuclear Age', in Till (ed.), *The Development of British Naval Thinking*, pp.160-181, quotation, p.162.
[133] Till, 'Introduction: British Naval Thinking', p.11.

strategy. In the British case, the debates between the maritime and continental schools of strategy; the former emphasising a maritime-centric basis for British strategy, the latter a land-power-centric conception;[134] provide an example of this type of analysis.

As previously stated, the central question underpinning the examination of the utility of maritime force is: what value do armed forces operating at or from the sea have in terms of contributing toward the attainment of national political objectives? The preceding discussion has raised the issue of maritime thinking and relating it to a specific context; the specific context for this thesis is the contemporary British setting. It is thus valuable to examine British thinking on the role and nature of maritime power to gain insight into perspectives concerning the utility of maritime force and its specific relation to the evolving requirements of British grand strategy and vice-versa. This includes the examination of the aggregate of British maritime thinking and whether it constitutes a discernible British 'school'. In other words, is there a sufficient coherency in the themes, ideas and principles addressed in British maritime literature to constitute a distinct British approach to maritime thinking? Till suggests that the British body of thought that emerged in the late 19th and early 20th centuries did have sufficient coherence to be regarded as a school.[135] The core tenets of the British maritime school will be discussed in the following chapter as a means by which to link contemporary British conceptual thinking and the formulation of doctrine with longer term trends in British maritime thinking. The salience of this is illustrated by Professor Eric Grove, Professor of Naval History at Liverpool Hope University and co-author of BR 1806 *The Fundamentals of British Maritime Doctrine*, on the writing of the latter with Commander Michael Codner, Royal Navy: 'I represented what might be called the "English School" of maritime strategy handed down from Corbett to his successors'.[136] The role of the British maritime school is yet more succinctly described by Till as being 'the pens behind the fleet'[137] and thus a

[134] For a contemporary analysis of the maritime versus continental debate, see Michael Codner, 'A Force for Honour? UK Military Strategic Options', in Michael Codner and Michael Clarke (eds.), *A Question of Security: The British Defence Review in an Age of Austerity* (London: I. B. Tauris, 2011), pp.153-173.
[135] Till, 'Corbett and the Emergence of a British School?' p.60.
[136] Eric Grove, 'The Discovery of Doctrine: British Naval Thinking at the Close of the Twentieth Century', in Till (ed.) *The Development of British Naval Thinking*, pp.182-191, quotation, p.183.
[137] Till, 'Corbett and the Emergence of a British School?' p.60.

valuable introduction to the development of contemporary British maritime thinking and doctrine.

Conclusion

This chapter has sought to outline the theoretical basis forming the conceptual and analytical framework for the subsequent development of the thesis. That is, the interaction of national policy, grand strategy, seapower and maritime strategy or, the ends, ways and means of utilising the sea for military purposes in support of national political objectives. Two points of elaboration regarding this statement are required. First, the reference to 'military purposes' is to distinguish from the broader use of the sea by the state for civilian (broadly defined) purposes – it should not be taken solely as a reference to the use of force at sea or from the sea, but as also including the constabulary and benign applications of maritime power. Second, the reference to 'national political objectives' should not be taken as excluding involvement in coalition or alliance operations – such involvement being a product of national policy.

In light of the preceding discussion in this chapter, and for clarity, a brief reiteration of the definitions of key terms – seapower, maritime strategy and grand strategy – to be used in this thesis, is provided. Seapower constitutes the state's capacity and capabilities to utilise the sea in its broadest terms in support of national political objectives. Maritime strategy, as defined by Corbett, constitutes 'the principles which govern a war in which the sea is a substantial factor'.[138] Grand strategy seeks to control and utilise the whole range of the instruments of state power to fulfil national objectives as defined by national policy. The definition of policy proposed by Jermy (see pages 42-43) will be used in this thesis.

The nexus of seapower, maritime strategy and grand strategy constitutes the overarching context for this thesis. This nexus provides the conceptual foundation from which it is intended to analyse and deduce the utility of maritime force, that is, what value do armed forces operating at or from the sea have in terms of contributing toward the attainment of national political objectives? This question

[138] Corbett, *Some Principles*, p.15.

is intended to provide that 'skein of connected thought about the nature, conduct and consequences of naval power'.[139] This is in order to link the strategic theory discussed in this chapter to the development of British thinking on maritime power, via the implementation of that thinking in the decision to structure British maritime forces around a particular vision of an aircraft carrier capability, to the role of maritime strategy in British grand strategy examined in the following chapters.

Underpinning all this, and the theory examined in this chapter, is a yet more fundamental question: *why does seapower matter*? This is especially significant to an island state such as the UK, and one that transcends the bounds of discussion set by issues of policy and strategy, and forms a component of the much wider subject of national identity. In regard to the analysis in this chapter, a major factor in explaining why thinkers such as Mahan and Gorshkov sought to explain what constituted seapower in its broadest context, as well as the aspects pertaining to naval strategy, as opposed to, for example, Corbett's focus on maritime strategy, is that being from an island nation, the audience Corbett was addressing already understood the basic premise of seapower. The audiences for Mahan and Gorshkov were conversely the policymakers of large continental powers – they had to be told *why* the sea mattered, before how to exploit it.[140] Thus, the analysis of the influence of national identity on the understanding of seapower is required alongside that of the factors relating to policy and strategy in the development of maritime thinking, and as alluded to by Gray (see page 50), will be dependent on national context. This constitutes the basis for the following chapter; an examination of the development of contemporary British maritime thinking and doctrine.

[139] Till, *Seapower*, p.41.
[140] I am grateful to Professor Andrew Lambert for emphasising the importance of this argument.

2. The Development of Contemporary British Maritime Thinking and Doctrine: An Overview

Introduction

The purpose of this chapter is to link the theoretical discussion of the preceding chapter with the applied analysis to be undertaken in the following chapters. In order to do this, this chapter examines the development of British maritime thinking and doctrine, that is, the specifically British thought on the roles and application of maritime power and the doctrine guiding its application. Doctrine in this regard constitutes 'a framework of principles, practices and procedures, understanding of which provides a basis for action. Maritime doctrine fulfils this function for the use of military power at and from the sea to achieve policy objectives.'[1] This provides the basis for what is defined in British thinking as the conceptual component of fighting power. *British Defence Doctrine* defines fighting power as consisting 'of a conceptual component (the thought process), a moral component (the ability to get people to fight), and a physical component (the means to fight)'.[2] The conceptual component includes the Principles of War (the overarching guidelines concerning the application of military power), Doctrine and conceptual innovation. It is of significant importance because, as *British Defence Doctrine* explains:

> The conceptual component provides the coherent intellectual basis and theoretical justification for the provision and employment of Armed Forces. It has relevance at all levels of warfare, not least the strategic level, where it provides the intellectual material needed for effective decision-making at the political-military interface. The conceptual component also serves an important role in preserving and taking forward corporate memory, experience and wisdom. In doing so, it reflects accumulated historical experience, improvements to existing operational practice (gained through lessons, analysis and experimentation) and continuous projections about the future security environment.[3]

The value of doctrine is summarised by Air Vice-Marshal (Ret'd) Michael Harwood in the following terms:

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[1] BR1806 *The Fundamentals of British Maritime Doctrine* (London: HMSO, 1995), p.12.
[2] MoD (UK)/DCDC, *British Defence Doctrine* (JDP 0-10 4th Edition, 2011), p.4-1.
[3] Ibid., p.4-4.

> Train relentlessly, rigorously and repeatedly for the known. Drills should be second-nature, not learning by rote but certainly by heart. This means that published military doctrine, standard operating procedures, checklists and mission rehearsals have inherent value, but only when they are committed to memory in such a fashion that they free the spirit to think, "What is different about the situation before my eyes right now?" *Dogma stifles, doctrine enlightens.*[4]

The analysis within this chapter is thus concerned with constructing the conceptual framework for the subsequent development of the thesis. It is principally focused on the contemporary development of British maritime thinking and doctrine. This encompasses the period since 1995 and the publication of BR1806 *The Fundamentals of British Maritime Doctrine* – the first official statement of doctrine published by the Royal Navy since the classified *Naval War Manual* (last published in 1969).[5] However, it is necessary to set this analysis within the longer-term context provided by history; as *The Fundamentals of British Maritime Doctrine* states: 'Doctrine has its foundation in history; the study, analysis and interpretation of experience. It provides a shared interpretation of that experience which can be taught, in order to provide a common starting point for thinking about future action.'[6] Professor Andrew Lambert has described doctrine as 'a dialogue between the past and the present for the benefit of the future.'[7] The historic development of British maritime thinking, effectively dating to the latter quarter of the 19th century[8] and the work of figures such as Professor Sir John Knox Laughton[9] and Vice Admiral Philip Colomb, via Sir Julian Corbett, Admiral Sir Herbert Richmond, Captain Stephen Roskill and Vice Admiral Sir Peter Gretton through the 20th century to the present, provides such a dialogue. This dialogue serves to shed light on the evolving analysis and interpretation of

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[4] Air Vice-Marshal (Ret'd) Michael Harwood, 'The Conceptual Component', in *Air Power 2014/15: Engaging in a Changing World* (Royal Air Force, 2014), pp.16-19, quotation, p.19. Emphasis added.

[5] BR 1806, *The Naval War Manual* (Ministry of Defence, Directorate of Naval Tactical and Weapons Policy, TW 271/1/63, January 1969).

[6] BR1806, *The Fundamentals of British Maritime Doctrine*, p.12.

[7] Andrew Lambert, '"History is the Sole Foundation for the Construction of a Sound and Living Common Doctrine": the Royal Naval College, Greenwich, and Doctrine Development down to BR1806' in Andrew Dorman, *et al. The Changing Face of Maritime Power* (London: Macmillan, 1999), pp.33-56, quotation, p.54.

[8] For detailed discussion of the genesis of British maritime thinking in the second half of the 19th century, see Andrew Lambert, 'The Development of Education in the Royal Navy: 1854-1914', in Geoffrey Till (ed.) *The Development of British Naval Thinking* (Abingdon: Routledge, 2006); Geoffrey Till, 'Corbett and the Emergence of a British School?' in Till (ed.), *The Development of British Naval Thinking*; and Donald Schurman, *The Education of a Navy: The Development of British Naval Strategic Thought 1867-1914* (London: Cassell, 1965).

[9] For example, see John Knox Laughton, 'The Scientific Study of Naval History', *RUSI Journal*, Vol.18, No.79 (1874), pp.508-527.

maritime thinking, its response to the changing strategic environment and enables the enduring principles of British maritime strategy to be deduced. Moreover, this on-going dialogue and the development and promulgation of doctrine serves to educate; *The Fundamentals of British Maritime Doctrine* states a role of doctrine as being to establish:

> ... A core understanding of the nature of maritime power both within and outside the Naval Service. Within the Royal Navy and Royal Marines it provides a platform upon which all teaching, training and tactical development will build. Outside the Service it will generate wider understanding of the particular and distinctive nature of the maritime environment, and the ways in which *maritime forces* operate.[10]

Thus, this chapter sets out to shed light on the foundations of that thinking upon which the contemporary platform of British maritime doctrine is built. From this, the enduring principles of British maritime strategy and concepts governing the roles and application of maritime power and their implications for the development of the physical component of British maritime fighting power can be deduced. In order to do this, the chapter will first consider the development of the British maritime school of thought. This provides the basis and historical context for the examination of the evolution of British maritime doctrine and associated key concepts from 1995 and the publication of *The Fundamentals of British Maritime Doctrine* to 2011 and the publication of the fourth edition of *British Maritime Doctrine*. The chapter will conclude with a consideration of the implications of British maritime thinking for capability development, in particular with regard to the Future Aircraft Carrier (CVF) programme. As will be discussed below, and in the following chapters, the substantial geopolitical and thus military-strategic changes heralded by the end of the Cold War, and with it a concomitant shift in emphasis in maritime roles from securing sea control to power projection, was reflected in British maritime doctrine, and in the rationale for the CVF programme.

The British Maritime School and the Principles of British Maritime Strategy

The concluding discussion in the preceding chapter emphasised the importance of national context and identity in the development of maritime thinking, especially with regard to the relative emphasis on broader notions of seapower or a more

[10] BR1806, *The Fundamentals of British Maritime Doctrine*, p.12. Emphasis original.

specific focus on maritime strategy (see pages 56-57). In this context, the evolution of thinking and trajectory of intellectual trends within the British maritime school provides significant and valuable insight into the development of British maritime strategic thought.

The difference in national context and its implications for the development of maritime, or more narrow naval thought, is discernible in comparing the influence and legacy of the principal works of Rear Admiral Alfred Thayer Mahan, US Navy, and Vice Admiral Philip Colomb, Royal Navy (1831-1899); the *Influence of Sea Power Upon History 1660-1783*[11] and *Naval Warfare: Its Ruling Principles and Practice Historically Treated*[12] respectively. Mahan's book was the first to be published (in 1890) and achieved seminal status as *the* classical exposition of seapower theory. Colomb's book was published the following year and achieved much recognition,[13] albeit not to the same extent as *The Influence of Sea Power*. However, the nature of the texts and the audiences they were written for must be taken into account when considering the impact of the respective texts. Mahan's audience, as noted on page 57, were the policy-makers of a large continental power and had to be educated in why seapower mattered at all before debating how it could be exploited. In contrast, *Naval Warfare* built upon the lectures Colomb was giving at the Royal Naval College Greenwich (six lectures per year from 1887 to 1895),[14] and was thus addressed to an audience already familiar with the concept of seapower, that is, the officers of the Navy of a maritime state. Professor Sir John Knox Laughton described the significance of *Naval Warfare* in his obituary of Admiral Colomb:[15]

> In 1891 he published his most elaborate and most instructive work on "Naval Warfare," [sic] in which, almost for the first time in modern naval literature, he enunciated and illustrated from history the true principles and conditions of sea

[11] Alfred Thayer Mahan, *The Influence of Sea Power Upon History 1660-1783* (Mineola, New York: Dover Books, 1987) [unabridged republication of the fifth edition (1894); originally published by Little, Brown and Company: Boston, 1890].
[12] Philip H. Colomb, *Naval Warfare: Its Ruling Principles and Practice Historically Treated*, Third Edition (London: W. H. Allen, 1899) (republished as two volumes with an 'Introduction' by Barry M. Gough (Annapolis: US Naval Institute Press, 1990).
[13] For discussion of this, see Barry M. Gough, 'Introduction' in Colomb, *Naval Warfare*.
[14] Andrew Lambert, 'The Naval War Course, *Some Principles of Maritime Strategy* and the Origins of "The British Way in Warfare"', in Keith Neilson and Greg Kennedy (eds), *The British Way in Warfare: Power and the International System, 1856-1956*, (Farnham: Ashgate, 2010), pp.219-256.
[15] Gough attributes Colomb's obituary to Laughton, Gough; 'Introduction', p.xxv.

> power *and its exercise*. It is true that Captain Mahan was working at the same subject simultaneously, perhaps *with a broader and more philosophical outlook*...[16]

The above quotation contains two significant points. The first, and relevant to the development of the British maritime school, is the reference to 'the true principles of sea power and its exercise'. A particular emphasis of *Naval Warfare* is 'Attacks on Territory from the Sea' – chapters 10 to 18 (out of 20) are under this heading – this follows on from seven chapters which are dedicated to 'The Struggle for the Command of the Sea' and 'Attempts to Gain Command of the Sea' (chapters two to nine: chapter one is entitled 'The Nature of Naval War' and chapter five 'The Differentiation of Naval Force). That is, excluding the first and fifth chapters and the two case studies (chapters 19 and 20 on 'Recent Illustrations of the Principles of Naval Warfare' and 'The Spanish-American War' respectively)[17] more than half (nine out of 16 chapters) are dedicated to examining the *exploitation* of seapower via the projection of power from the sea. This is in distinct contrast to Mahan, who concentrated on action at sea and only implicitly referred to the impact of seapower on events on land.[18] The second point reinforces the first and the preceding discussion concerning the difference in outlook between Mahan and Colomb, namely the point that Mahan had 'perhaps ... a broader and more philosophical outlook'. In other words, Mahan was concerned more with the general theory of seapower whereas Colomb was much more concerned with the effective application of seapower, especially in order to project power ashore.

Colomb's work, in particular *Naval Warfare*, constitutes a significant contribution to the early development of the British maritime school. This is especially with regard to firstly his making 'naval history a respectable and relevant subject of enquiry for naval officers'.[19] This also reflects the influence of Laughton[20] - an influence which is clearly visible in *Naval Warfare*, most prominently in chapter 11:

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[16] 'Death of Admiral Colomb', *The Times*, Monday, October 16, 1899 (via The Times Digital Archive). Emphases added.
[17] Chapter 19 was incorporated into the second edition published in 1895; chapter 20 was added to the third edition published in 1899.
[18] Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Second Edition (Abingdon: Routledge, 2009), p.53.
[19] Till, 'Corbett and the Emergence of a British School?' p.65.
[20] For example, see Barry M. Gough, 'The Influence of Sea Power Upon History Revisited: Vice-Admiral P H Colomb, RN', *RUSI Journal*, Vol.135, No.2 (Summer 1990), pp.55-63.

> In describing the events surrounding the sailing, voyage, and dispersal of the Armada, I have found that I cannot possibly do better than to quote largely from a paper by Professor Laughton...entitled "The Invincible Armada, a Tercentenary Retrospect". In preparing his paper, Mr. Laughton has consulted the best authorities, and its value is of no passing character.[21]

Colomb incorporated some 15 pages of Laughton's analysis into his chapter.[22] Secondly, and most significantly, Colomb was the antecedent of Sir Julian Corbett. The latter read *Naval Warfare* and this is reflected in his work, for example, with regard to the use of the term 'command of the sea' and enthusiasm for 'fleet in being'.[23] The following are four particular areas that shed light on this connection. First, with regard to 'command of the sea', Colomb writes:

> The term "command of the sea," [sic] as applied to denote power to prevent the passage of an enemy intending to descend upon the land, is necessarily indefinite. Command may be absolutely complete, not only for that, but for all other purposes. It may be sufficiently complete to secure an expedition proceeding over sea for the attack of territory, from any sort of interruption either then, or at the point of attack; and yet it may not be sufficiently complete to make communications with the base from the point of attack absolutely secure. It may then be found by fine gradations, less and less complete, until command of the sea is wholly lost...[24]

Furthermore, Colomb defines three levels of command in the context of the utility of the sea, that is:

> We see, therefore, these three states of the sea considered as a strategic surface or medium for transport: the state of *Indifference*, of *Disputed Command*, and of *Assured Command*. And evidently there must be a continual passing from one state into a higher, and back again.[25]

In comparison, Corbett states the following regarding command of the sea:

> If the object of the command of the sea is to control communications, it is obvious it may exist in various degrees. We may be able to control the whole of the common communications as the result either of great initial preponderance or of decisive victory. If we are not sufficiently strong to do this, we may still be able to control some of the communications; that is, our control may be general or local.[26]

In addition:

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[21] Colomb, *Naval Warfare*, vol.2, p.270.
[22] Ibid., pp.270-285.
[23] I am grateful to Professor Eric Grove for this insight.
[24] Ibid., pp.245-246.
[25] Ibid., pp.253-254.
[26] Sir Julian Corbett, *Some Principles of Maritime Strategy* (reprinted with 'Introduction' by Eric Grove (Annapolis, MD: Naval Institute Press, 1988)), p.103.

> .... It must be taken that command may exist in various states or degrees, each of which has its special possibilities and limitations. It may be general or local, and it may be permanent or temporary. General command may be permanent or temporary, but mere local command, except in very favourable geographical conditions, should scarcely ever be regarded as more than temporary, since normally it is always liable to interruption from other theatres so long as the enemy possesses an effective naval force.[27]

Although Colomb and Corbett both use the term 'command of the sea', the meaning each conveys is different: Colomb regards the sea as 'territory' in contrast to Corbett's conception of the sea as a means of communication.[28] This is evident in the second quotation above from Colomb in which he refers to the sea 'as a strategic surface'. In addition, in the opening chapter of *Naval Warfare*, Colomb states:

> ...if we look back to what may be called the early days of naval warfare under sail, we shall observe that there was little or no contention for *occupation of, or command over, the sea*...[29]

The second example concerns the concept of a 'fleet in being'. Colomb dedicates chapter six of *Naval Warfare* to the analysis of French attempts to invade England between 1690 and 1692 and particularly the efforts of Lord Torrington as commander of the Home Fleet in 1690 to deny the French sufficient command of the sea to undertake such an endeavour. In this regard, Colomb cites Torrington:

> ...Had I fought otherwise, our fleet had been totally lost, and the kingdom had lain open to an invasion...As it was, most men were in fear that the French would invade; but I was always of another opinion; for I always said, that whilst we had a fleet in being, they would not dare to make an attempt...whilst we observe the French, they can make no attempt either on sea or shore, but with great disadvantages; and if we are beaten all is exposed to their mercy...[30]

Colomb summarised Torrington's approach thus:

> While if he could altogether avoid fighting, and merely wait and watch, he would render the great French armament powerless, and entirely defeat its end. It could do absolutely nothing if Torrington declined to be drawn into a battle, because the moment it attempted anything by way of a landing, or an attack upon the shore, it would give to the British admiral exactly that advantage which was required to made [sic] his attack successful.[31]

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[27] Ibid., p.104.
[28] I am grateful to Professor Eric Grove for highlighting this.
[29] Colomb, *Naval Warfare*, vol.1. p.21. Emphasis added.
[30] Ibid., p.154.
[31] Ibid., p.147.

Corbett also cited Torrington's example in his analysis of a 'fleet in being' within the wider context of discussing methods of disputing command. The opening paragraph of the chapter examining methods of disputing command in *Some Principles of Maritime Strategy* provides valuable insight into both how Corbett conceived of the utility of the defensive in naval warfare and his intellectual approach:

> In dealing with the theory of sea command, attention was called to the error assuming that if we are unable to win the command we therefore lose it. It was pointed out that this proposition, which is too often implied in strategical discussion, denies in effect that there can be such a thing as strategical defensive at sea, and ignores the fact that the normal condition in war is for the command to be in dispute. Theory and history are at one on the point. Together they affirm that a Power too weak to win command by offensive operations may yet succeed in holding the command in dispute by assuming a general defensive attitude.[32]

The above quotation affirms the value of the defensive as a means of disputing command of the sea – a point also stressed by Colomb with regard to Torrington. In addition, Corbett cites the role of theory and history as the means by which to deduce the principles of maritime warfare – the core tenet of Corbett's intellectual approach (see below).

The third example concerns the purpose of naval operations, that is, both Colomb and Corbett stress the exploitation of command of the sea to enable other activities. As noted above, Colomb especially emphasised the projection of power from the sea and Corbett developed his analysis of British naval affairs and their relation to national strategy within the context of espousing the value of maritime strategy.[33] It must be noted that Colomb does not explicitly advocate a maritime approach; rather, he focuses on the naval aspects of power projection, but this nonetheless does explicitly go beyond defining attaining command of the sea as the principal ends of naval warfare.

The fourth example concerns the notion of limited war; this was an area significantly developed by Corbett but there are indications of thought on this by

[32] Corbett, *Some Principles*, p.209.
[33] For discussion of the development of Corbett's approach, see Lambert, 'The Naval War Course', particularly pp.219-221; and Donald Schurman, 'Civilian Historian: Sir Julian Corbett' in *The Education of a Navy: The Development of British Naval Strategic Thought 1867-1914* (London: Cassell, 1965).

Colomb. In the concluding chapter of *Naval Warfare* – a case study of the Spanish-American War of 1898, Colomb in his introduction states:

> In both these wars [also referring to the Sino-Japanese War of 1894-5 covered in the preceding chapter] there was a particular objective to which attention was directed, and which gave a certain colour to what was done, differing from that which has generally controlled and modified the conduct of naval war when nation has been set against nation with only a general struggle for the mastery.[34]

Colomb also cited the American War of Independence in the above context, and referring to the French involvement in that conflict, stated:

> The peace naturally followed [the British defeat at Yorktown], because the French had attained the chief object [the removal of the revolting American colonies from British imperial control] for which they went to war, and because its continuation might – after such a victory – have proved wholly disadvantageous to them.[35]

The contexts Colomb discussed are similar to the criteria Corbett highlighted as constituting the basis for limited war:

> To satisfy the full conception of a limited object, one of two conditions is essential. Firstly, it must be not merely limited in area, but of really limited political importance; and secondly, it must be so situated as to be strategically isolated or to be capable of being reduced to practical isolation by strategical operations.[36]

The examples provided by Colomb – the American War of Independence, the Sino-Japanese War of 1894-5 (also referred to as the Korean War due to the focus of the conflict) and the Spanish-American War of 1898 – shared aspects of both conditions articulated by Corbett: the potential for strategic isolation of the objective by one of the belligerents (for example, the American seaboard from Europe, Cuba from Spain and the Korean peninsula) and limited political importance.

Colomb did not however further develop a line of thinking pertaining to notions of limited war in *Naval Warfare*, rather his analysis concentrated on the naval aspect of the Spanish-American War. This reflects Colomb's approach, succinctly described by Lambert as: 'a synthesis between naval history and strategic ideas'.[37] In contrast, Corbett developed a more sophisticated and multi-faceted approach

[34] Colomb, *Naval Warfare*, vol.2., p.518.
[35] Ibid., p.519.
[36] Corbett, *Some Principles*, p.55.
[37] Lambert, 'The Naval War Course', p.222, footnote 10.

which extended beyond the use of naval history, and incorporated theoretical study. Lambert describes Corbett's approach thus:

> While the influence of Professors John Knox Laughton and Samuel Rawson Gardiner[38] was obvious in his handling of evidence, Corbett's intellectual approach was original. He placed the study of naval affairs in the broad context of national policy, locating dramatic passages of combat in the development of national aims. The ability to draw out the larger patterns and ideas that informed past events would be his greatest asset. With forensic skill Corbett fashioned coherent, persuasive strategic studies from fragmentary evidence. [39]

In considering the contribution of Colomb to the development of the British maritime school and his influence on Corbett, his role in the creation of the Navy Records Society must be noted. The Navy Records Society was created in 1893 by Laughton and Admiral Sir Cyprian Bridge;[40] Colomb was a member of the original provisional committee (holding its first meeting on the 27 June 1893) established to determine the name and rules of the society.[41] Corbett joined the society in July 1893,[42] and would thus have regularly met Colomb within the context of Navy Records Society meetings until the latter's death in 1899.[43]

The most important and enduring contribution to the development of British maritime thinking and doctrine (see below) was that made by Corbett. It is valuable by means of an introduction to briefly note Corbett's personal background. Lambert, describing Corbett as 'an Edwardian gentleman of leisure', establishes Corbett's personal context thus: 'Despite obtaining a good degree and qualifying for the Bar, he spent his days travelling, fishing and writing novels and plays...'[44] The implications of this for Corbett's writing of naval history and strategy is effectively summarised by Donald Schurman (born 1925), the eminent Canadian naval historian and biographer of Corbett:

> Mahan's approach had been to link detailed history of the tactics of important naval actions to meaningful but general accounts of diplomatic activity. Corbett,

[38] An eminent 19th century British historian, principally associated with the study of the English Civil War. 'Samuel Rawson Gardiner (British Historian), *Encyclopaedia Britannica*, http://www.britannica.com/EBchecked/topic/225892/Samuel-Rawson-Gardiner. Accessed 25 July 2014.
[39] Ibid. pp.219-220.
[40] Lambert, 'The Development of Education in the Royal Navy', p.49.
[41] Captain A. B. Sainsbury, 'The Centenary of the Navy Records Society 1893-1993', The Navy Records Society (previously available online).
[42] Schurman,, p.149.
[43] I am grateful to Professor Andrew Lambert for this insight.
[44] Lambert, 'The Naval War Course', p.219.

> however, traced the growth and use of naval strategy and from the first based his interpretations on extensive documentary research. More detailed than Mahan and less dogmatic than Richmond, Corbett brought to his subject the training of the Bar, the temperament of a novelist and the charm of a cultured mind.[45]

The significance of Corbett's work was its foundation in the nexus of naval history, national policy, the theoretical study of war and from 1903 onwards, the requirements of professional service education via his involvement with the Naval War Course.[46] Furthermore, by developing a theoretical approach inspired by Clausewitz, Corbett further enhanced the coherence and quality of his work.[47] Schurman states with regard to *Some Principles of Maritime Strategy*:

> Whatever its general merit, *Some Principles of Maritime Strategy* did two things very competently: it adapted Clausewitzian thought to fit the needs of a sea power and to conform to the special idiosyncrasies of sea warfare; and it took past practice and codified it. Corbett wrote this strategy book as a result of rather than as a key to historical study. That is why the careful historian must prefer him, with all his misty outlook, to the downright plain-speaking Mahan who learned his principles first and then went to history for his examples.[48]

The continuing value of *Some Principles of Maritime Strategy* and reflecting Corbett's influence past and present, is its role either as unofficial strategic doctrine or as a source of inspiration for contemporary doctrine. Professor Eric Grove, co-author of BR1806 *The Fundamentals of British Maritime Doctrine*, states firstly with regard to the role of *Some Principles* as 'doctrine':

> It is quite clear from contemporary sources that Corbett's 'theory' was what we should now call 'doctrine'. French officers visiting the Grand Fleet in the First World War were referred to *Some Principles* when they enquired about British naval doctrine.[49]

The enduring influence of Corbett and his providing a source of inspiration for contemporary doctrine is also made explicit by Grove:

> Corbett's insistence that naval strategy was but part of a larger maritime whole and the consistent teaching of this basic doctrinal point by at least three generations of lecturers at the Royal Naval College, Greenwich, made it certain that 1806 should be regarded as the fundamentals of *maritime* doctrine. [50]

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[45] Schurman, p.149.
[46] For analysis of Corbett and the Naval War Course, see Lambert, 'The Naval War Course'.
[47] Lambert, 'The Naval War Course', p.229.
[48] Schurman, p.182.
[49] Eric Grove, 'The Discovery of Doctrine: British Naval Thinking at the Close of the Twentieth Century' in Till (ed.) *The Development of British Naval Thinking*, pp.182-191, quotation, p.184.
[50] Eric Grove, 'BR1806, Joint Doctrine and Beyond' in Dorman *et al. The Changing Face of Maritime Power*, pp.57-64, quotation, p.59.

This influence also extended beyond the UK; for example, Till states:

> …. The British set a standard in doctrinal formulation that others have responded to. One of the most interesting such responses is *Australian Maritime Doctrine*, which appeared in 2000. Similar in approach to, and obviously influenced by, British doctrinal formulations it covers much the same ground but of course gives it an Australian spin reflecting their own particular national context.[51]

A further illustration of Corbett's influence is provided by Schurman:

> It may help to gauge the impact of Corbett's strategic thought on the naval mind, to realize that in 1916 Lord Sydenham[52] of Coombe saw in Corbett's doctrines, as they had been given to the War College before 1914, one reason for the lack of spectacular British naval success at sea...Whatever the truth of such allegations they do indicate that Corbett's ideas influenced naval officers.[53]

This quotation also provides insight into a key aspect of the debate concerning the utility of doctrine, in particular with regard to the publication of BR1806 *The Fundamentals of British Maritime Doctrine*. Grove describes the problem thus:

> The Royal Navy...was a little reluctant to go down the 'doctrinal' route...The reason was an understandable reluctance for the Royal Navy to become too dogmatic in its professional approach. The essence of the naval profession was deemed to be flexibility of mind and a willingness to think 'out of the box'. The contrast between the perception of Nelson as a (good and successful) tactical innovator compared to the apparently sclerotic and over-centralised Grand Fleet of Sir John Jellicoe (that failed to achieve another Trafalgar at Jutland) was a potent one.[54]

Lord Sydenham's critique of Corbett and the previous reluctance of the Royal Navy to promulgate a written doctrine serves to illuminate the value of Corbett's Clausewitzian-based approach to the theory of war:

> The truth is that the mistrust of theory arises from a misconception of what it is that theory claims to do. It does not pretend to give the power of conduct in the field: it claims no more than to increase the effective power of conduct. Its main practical value is that it can assist a capable man to acquire a broad outlook whereby he may be the surer his plan shall cover all the ground, and whereby he may with greater rapidity and certainty seize all the factors of a sudden situation...Its practical utility; however, is not by any means confined to its effects upon the powers of a leader. It is not enough that a leader should have the ability to decide rightly; his subordinates must seize at once the full meaning of his decision and be able to express it with certainty in well-adjusted action. For this every man concerned must have been trained to think in the same plane; the

[51] Till, *Seapower*, p.67.
[52] Sir George Clarke; for discussion of his connection and influence on Corbett, see Lambert, 'The Naval War Course', especially pp.226-227.
[53] Schurman, p.150.
[54] Grove, 'The Discovery of Doctrine', p.182.

> chief's order must awake in every brain the same process of thought; his words must have the same meaning for all.[55]

That is, Corbett did not advocate the theoretical study of war as a means by which to inculcate a certain mode of thinking; rather, the approach advocated by Corbett is to engender a flexible mind-set and enhance individual and collective effectiveness through self-education. Corbett in this context cited Clausewitz: 'It should educate the mind of the man who is to lead in war, or rather guide him to self-education, but it should not accompany him on the field of battle.'[56] The above quotation from Corbett was cited by Grove as part of the justification for BR1806 *The Fundamentals of British Maritime Strategy*,[57] and with relevance to Lord Sydenham's critique, Lambert makes the significant observation concerning the Naval War Course, of which Corbett was so prominently involved, that: 'The tragedy of the War Course was that John Jellicoe, the one officer who really needed to attend, was by far the most conspicuous of those who did not.'[58]

The influence of Corbett, direct and indirect, on the subsequent development of British maritime thinking is multi-faceted, covering his intellectual approach, the core tenets of his thought (discussed in chapter one), and via those who have followed Corbett and were influenced by his thinking. The latter include Admiral Sir Herbert Richmond, Captain Stephen Roskill and Vice Admiral Sir Peter Gretton, and are examined below. Further, in September 2007, the Corbett Centre for Maritime Policy Studies was established within the King's College London Defence Studies Department at the Joint Services Command and Staff College, with the intention to:

> ...inform national and international debates on maritime policy issues. It will do so by fostering policy-relevant research and providing a forum for debate and analysis in which academics, policy-makers and practitioners can interact.[59]

The connection between academia, policy-makers and the Royal Navy has and will remain central to the development of British maritime thinking. The contribution to the body of British maritime thought by those who have both seen

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[55] Corbett, *Some Principles*, pp.3-4.
[56] Ibid., p.4.
[57] Grove, 'The Discovery of Doctrine', p.184.
[58] Lambert, 'The Naval War Course', p.249.
[59] Tim Benbow, 'Introduction', *Defence Studies*, Vol.8, No.2 (June 2008), pp.146-147. This particular issue of *Defence Studies* was a special edition to mark the launch of the Corbett Centre for Maritime Policy Studies.

uniformed service and worked academically is particularly interesting. This includes the above-mentioned Richmond, Roskill and Gretton who all served in the Royal Navy, but it also includes notable contributions from those who had served outside of the naval service. The aforementioned Donald Schurman served in the Royal Canadian Air Force during the Second World War as a navigator on-board B-24 *Liberators*;[60] and Professor Bryan Ranft (1917-2003) who served in the Royal Artillery during the Second World War.[61] Ranft was both a member of the teaching staff at the Royal Naval College Greenwich and Visiting Professor of Naval History at King's College London.[62] In addition, he served as a connection between two generations of maritime thinkers, having been sent by Gretton (whilst Commandant at Greenwich) to undertake a PhD (examining why the UK gave up convoy) at Oxford[63] and would subsequently supervise amongst others, Andrew Lambert at King's College London.[64]

Admiral Sir Herbert Richmond (1871-1946) was a key figure within the British maritime school, and constituted a leading example of a 'sailor-scholar'.[65] Richmond's naval career was mixed. Before the First World War he had enjoyed accelerated promotion, serving in 1906 as Naval Assistant to the First Sea Lord Admiral Sir John Fisher and in 1908, was promoted to Captain and given command of the revolutionary battleship HMS *Dreadnought*.[66] Richmond also went through periods when he was out of favour and consigned to minor roles. This was due to him being 'increasingly regarded by those he tended to criticise [in the Admiralty], perhaps too freely, as that dangerous kind of naval officer who read and thought too much.'[67] Following retirement from the Royal Navy in 1929, Richmond dedicated himself to academia: in 1934, he was appointed to the Vere Harmsworth Chair of Imperial and Naval History at Cambridge and in 1936 was

[60] I am grateful to Professor Andrew Lambert for this insight.
[61] Geoff Till, 'Epilogue: Professor Bryan McLaren Ranft', in Till, *The Development of British Naval Thinking*, p.192.
[62] Ibid., p.193.
[63] I am grateful to Professor Andrew Lambert for this insight.
[64] Andrew Lambert, 'Introduction to the 2011 Edition' in *The Crimean War: British Grand Strategy Against Russia, 1853-56*, Second Edition (Farnham: Ashgate, 2011), p.3.
[65] This was used by Barry Hunt as the title for his biography of Richmond; *Sailor – Scholar: Admiral Sir Herbert Richmond 1871-1946* (Waterloo, Ontario: Wilfred Laurier Press, 1982).
[66] Till, 'Richmond and the Faith Reaffirmed: British Naval Thinking Between the Wars', in Till (ed.) *The Development of British Naval Thinking*, pp.103-133, specifically, p.103.
[67] Ibid.

made Master of Downing College, Cambridge.[68] Richmond made a significant contribution to the development of British maritime thinking, especially with regard to further raising awareness of the importance of naval history (including its role in the education of officers),[69] emphasising the role of maritime power at the grand strategic level, and as a founder of *The Naval Review*, the independent professional journal for Royal Navy officers. Further, he served as an 'inter-generational' link between maritime thinkers. Richmond was a 'disciple' of Corbett (Corbett knew Richmond's father and Richmond before he joined the Royal Navy)[70] and Richmond's first book, *The Navy in the War of 1739-1748*, was written with the encouragement of Corbett.[71] In addition, Richmond would himself be a major influence on historians such as Professor Arthur J. Marder, author of such works including *The Anatomy of British Sea Power* and a biography of Richmond – *Portrait of an Admiral – The Life and Papers of Sir Herbert Richmond*, and Captain Stephen Roskill.[72]

In February 1923, Richmond gave the Raleigh Lecture on History (named after Sir Walter Raleigh) at the British Academy on 'National Policy and Naval Strength XVIth to XXth Century'. The lecture, subsequently reprinted in the *Naval Review*,[73] provides valuable insight into the general tenets of Richmond's approach and thinking and is also significant for shedding light on Richmond's contribution to the development of the notion of the 'British way in warfare' particularly associated with Captain Sir Basil Liddell Hart. Four key elements of Richmond's thinking can be deduced from his Raleigh Lecture. First, Richmond, in order to demonstrate the core tenet of his argument, that is, the essential connection between British national policy and naval strength, utilised history as a tool to shed light on and explain his argument. This approach is evident from the title of Richmond's lecture, but it is also explained thus:

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[68] 'Leading Figures: Admiral Sir Herbert Richmond (1871-1946)', Navy Records Society, http://navyrecords.org.uk/pages/about-nrs/leading-figures/admiral-sir-herbert-richmond/. Accessed 8 Sept 2013.
[69] Till, 'Richmond and the Faith Reaffirmed', p.127.
[70] Remarks by Professor Andrew Lambert at Corbett Centre Commemorative Workshop, 30 June 2011.
[71] Till, 'Richmond and the Faith Reaffirmed', p.104.
[72] Ibid., p.127; and Stephen Roskill, 'The Richmond Lecture', *The Naval Review*, Vol.57, No.2 (April 1969), pp. 135-146.
[73] Herbert Richmond, 'National Policy and Naval Strength XVIth to XXth Century. The Raleigh Lecture on History', *The Naval Review*, Vol.11, No.3 (August 1923), pp.414-429.

> Many threads run through that great fabric, the National Policy of England of the last three centuries, and none will take so narrow a view as to say that any single thread has dominated it throughout all those years ... I do not pretend to make a survey of Policy in all its transitions ... but only to make some slight examination of the degree to which that part of it relating to the maintenance of strength at sea – by which I mean the combination of all its elements, commercial and fighting strength – has actually dictated or influenced its course.[74]

Till has stated with regard to Richmond's utilisation of history that 'Richmond was using its "lessons" not to inform a general theory of maritime strategy, as Mahan and Corbett did, but simply to explain the complex role of seapower in Britain's security past and present'.[75] This establishes the foundation for the following three points. Richmond, as indicated in the above quotation, used a broad conception of seapower encompassing both its economic and military dimensions and this was emphasised throughout his analysis of the connection between national policy and naval strength from the 16th to the 20th centuries. In this regard, he cited examples including Raleigh's thinking on the constitution of the English national interest and the context within which the Navigation Acts were developed.[76] The enduring importance of seapower in British history was used by Richmond to illustrate the third element of his thinking: the symbiotic link between British national policy and maritime strategy. The introductory paragraph of 'National Policy and Naval Strength XVIth to XXth Century' suggests that:

> We are all familiar with the idea that naval strength is essential to the security of this kingdom of ours, and for the support of its external policy. To this there is a corollary which is, perhaps, less familiar; that external policy itself aims at the maintenance of our naval strength. Indeed, we may go even further and say that the attitude taken up by this country in many of the great international situations and movements has been determined finally by the effect one or another course of action would have upon our strength at sea.[77]

By considering the corollary of the maritime contribution to national policy, that is, the requirement(s) for national policy to maintain the state's maritime capabilities, Richmond brings to the fore a most important point: the development and sustainment of seapower is predicated upon a national policy that seeks the former as an objective.[78] In 'National Policy and Naval Strength XVIth to XXth

[74] Ibid., pp.414-415.
[75] Till, 'Richmond and the Faith Reaffirmed', p.127.
[76] Richmond, 'National Policy and Naval Strength', p.416 and pp.419-420 respectively.
[77] Ibid., p.414.
[78] See chapter one, pp.24-27 for discussion of the influence of national policy on the development of seapower.

Century', Richmond concludes his analysis by highlighting, in historical context, the influence of national policy on the maintenance of seapower:

> Thus, through different periods, we can trace at least one definite aim running with slight, very slight, interruption through our external policy: that by its efforts it shall contribute to supplement the internal efforts to maintain supremacy at sea. At one time we see our statesmen concluding alliances with an eventual aim of diverting a prospective rival's money from his navy to his army; at another to procure active naval assistance, when the resources of the rivals appear capable of outstripping us alone; our alliances aim also, at other times, at preventing the principal hostile state from seizing territory of naval importance – the Low countries, Dunkirk, Sicily, the Dardanelles; and we view the occupation of such commanding points unfavourably or favourably according to whether it will or will not weaken our security at sea ... that is to say, we esteem such territory in terms of its influence upon our strength at sea.[79]

Richmond's focus on the operation of seapower at the grand strategic level also sheds light on, and this is evident in the above quotation, his influence on the development of the notion of a 'British way in warfare'. The references, for example, in the above quotation to securing alliances in order to divert a rival's attentions from the sea to the land is one facet of the 'British way in warfare'. Moreover, elsewhere in the paper, references to the 'Municipal effort', that is, the provision of money to allies to sustain them,[80] and the use of sea-based economic pressure to enforce compliance upon an adversary,[81] combined with a general focus on naval strength, further highlight key components of the 'British way in warfare'.[82] Richmond's influence on the development of the concept of a 'British way in warfare' constitutes one of his most important contributions to the development of British strategic thinking.[83]

Captain Stephen Roskill (1903-1982) is a second example of an eminent sailor-scholar; he was recognised both as a very good officer and technically competent but also clever.[84] This was reflected in his latter postings: first to the British Admiralty Delegation in Washington and then as Senior British Observer at the

[79] Richmond, 'National Policy and Naval Strength', pp.428-429.
[80] Ibid., p.428.
[81] Ibid., p.421.
[82] See chapter one, pp.48-49 for discussion of Liddell Hart's conception of the 'British way in warfare'; the summary of its key features, as compiled by Till illustrates the above-described influence of Richmond.
[83] See Andrew Lambert, 'Preface' in Sir Herbert Richmond, *National Policy and Naval Strength and Other Essays* (Modern Revivals in Military History), (Aldershot: Gregg Revivals, 1993) [new edition of 1928 original], p.xxi and p.xxvi.
[84] Interview with Dr Harry Dickinson, Shrivenham, 23 August 2011.

Bikini Atoll atomic tests;[85] and following his early retirement from the Royal Navy in 1949 on health grounds,[86] as the official historian of the Royal Navy in the Second World War. Roskill, like Richmond before him, would enjoy an association with Cambridge University, becoming in 1961 a Senior Research Fellow, and in 1971, a Pensioner Fellow – both held at Churchill College where he was involved in the early development of the Churchill Archives Centre.[87] The publication of the official history, the three volume *The War at Sea 1939-1945* (published between 1954 and 1961), established Roskill's reputation as a naval historian and marked an important contribution to the development of British maritime thinking. This is particularly with regard to the first chapter of the first volume entitled 'Maritime War and Maritime Strategy' which details the conceptual basis for the subsequent historical account. It also indicates the influence of Corbett on Roskill's thought; the basis for Roskill's definition of maritime strategy is that enunciated by Corbett: 'the principles which govern a war in which the sea is a substantial factor'.[88] Roskill places the control of sea communications at the core of his conception of maritime strategy and adds, in terms that are reflected in contemporary doctrine, that:

> .... Control of sea communications in the modern sense necessitates a large measure of control of the air over those communications as well as control of the waters beneath... If either control of the air over the sea or control of the water beneath the surface of the sea is inadequate, then we should not possess sufficient control of the communications which pass on its surface. The aim of maritime strategy is therefore not so much to establish complete control of all sea communications, which would be an ideal hardly attainable until final victory was almost won, as to develop the ability to establish zones of maritime control wherever and whenever they may be necessary for the prosecution of the war in accordance with the directions of the Government.[89]

The above quotation is significant because it essentially provides a modern statement of the requirements of maritime strategy: it is Corbettian in principle but also speaks of the three-dimensional nature of the maritime environment and control, rather than command, of communications. By means of a comparison, the

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[85] Jock Gardner, 'All Sorts of Wars: British Naval Thinking and Technology in the Second World War' in Till, (ed.) *The Development of British Naval Thinking*, pp.134-159, specifically pp.145-146.
[86] Ibid., p.146.
[87] Janus: The Papers of Stephen Roskill, http://janus.lib.cam.ac.uk/db/node.xsp?id=EAD%2FGBR%2F0014%2FROSK. Accessed 9 September 2013.
[88] Cited in Stephen Roskill, *The War at Sea 1939-1945*, Volume. 1 (London: HMSO, 1954), p.2.
[89] Ibid., p.3.

following is the definition of sea control as given in the current edition of *British Maritime Doctrine*:

> Sea control is the condition that exists when there is freedom of action to use an area of the sea for one's own purpose for a period of time and, if necessary, deny its use to an opponent. '*Sea control depends upon control of the surface and sub-surface environments...and the air above the area in which is required*' [quotation from Allied Joint Publication 3.3.3 *Air Maritime Coordination*]...The geographical extent of sea control may vary from local control of a strategic choke point or concentration of forces, to domination of very large sea areas...[90]

Roskill also significantly accounted for the impact of aircraft on the nature of maritime power. In this regard, Roskill states:

> It seems, therefore, justifiable to attempt a redefinition of the elements comprising maritime power, and the chief reason why this has become necessary is that shore-based and carrier-borne aircraft have shown themselves to be capable of carrying out a part, and in some circumstances the whole, of the duties borne for so long by one or other class of fighting ship.[91]

It is valuable to note that Roskill referred to both shore-based and carrier-borne aircraft as elements comprising maritime power: this is an especially important element of British strategic debate and will be discussed in detail in subsequent chapters.

In addition to *The War at Sea*, Roskill also authored books including *The Strategy of Sea Power* (derived from the Lees-Knowles lectures he gave at Cambridge in 1961),[92] *Naval Policy Between the Wars* (two volumes) and contributed to the Navy Records Society by editing *Documents Relating to the Royal Naval Air Service*; Roskill was also a regular contributor to *The Naval Review*.[93] As with Corbett and Richmond, part of Roskill's contribution to the development of British maritime thinking was via his influence on other scholars, a notable example being Vice Admiral Sir Peter Gretton.[94]

Vice Admiral Sir Peter Gretton (1912-1992) served with distinction in the Second World War, particularly as an escort group commander in the Battle of the

[90] MoD (UK)/DCDC, *British Maritime Doctrine*, pp.2-10 to 2-11.
[91] Roskill, *The War at Sea 1939-1945*, vol.1, p.5.
[92] Gardner, 'All Sorts of Wars', p.147.
[93] A. B. Sainsbury, 'Stephen Wentworth Roskill, CBE, DSC, LITT. D, FBA, Captain, Royal Navy, 1903-1982: An Obituary', *The Naval Review*, Vol.71, No.1 (January 1983), pp.3-4.
[94] Gardner, 'All Sorts of Wars', p.145.

Atlantic,[95] and would in the course of his naval career be appointed to positions including Senior Naval member of Directing Staff at the Imperial Defence College, Lord Commissioner of the Admiralty and finally, Deputy Chief of the Naval Staff and Fifth Sea Lord.[96] Following retirement from the Royal Navy, Gretton, like Richmond and Roskill before him, moved into academia, becoming domestic bursar at University College Oxford from 1965-1971.[97] He contributed to *The Naval Review* and published books on the Battle of the Atlantic, a biography of Sir Winston Churchill and *Maritime Strategy: A Study of British Defence Problems*.[98] *Maritime Strategy* marked an important contribution to British maritime thinking; it articulated a realistic conception of the requirements for British maritime strategy, as a component of wider grand strategy, based on the lessons of history (including a chapter dedicated to convoy, deriving from the author's personal experience) and the thinking of Corbett, Richmond and Roskill. Gretton cites Corbett's basic definition, and Roskill's confirmation, of maritime strategy as 'the principles which govern a war in which the sea is a substantial factor' but adds 'But while it is accurate, this definition does not seem to me to go far enough and needs amplification'.[99] In order to do this, Gretton stated:

> So I have preferred to borrow, and slightly to amend Richmond's definition of sea power and thus to describe maritime strategy as 'that which enables a nation to send its armies and commerce across those stretches of sea and ocean which lie between its country and the countries of its allies and those territories to which it needs access in war, and to prevent its enemy doing the same'.[100]

Gretton, influenced by Roskill, stated 'The ultimate object of a maritime strategy is to establish such control that the sea can be used whenever and wherever desired and to deny its use to the enemy';[101] this control deriving from the instruments of seapower as defined by Roskill 'with great clarity'.[102] The instruments of sea power, encompassing three elements – Strength (consisting of

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[95] Ian McGeoch, 'Vice-Admiral Sir Peter Gretton KCB, DSO**, OBE, DSC', *The Naval Review*, Vol.81, No.1 (January 1993), pp.3-4. McGeoch described Gretton in his obituary as an 'outstanding naval leader'.
[96] 'Gretton, Sir Peter (William) (1912-1992), Vice Admiral', Liddell Hart Centre for Military Archives, http://www.kcl.ac.uk/lhcma/locreg/GRETTON.shtml. Accessed 9 September 2013.
[97] Ibid.
[98] Vice Admiral Sir Peter Gretton, *Maritime Strategy: A Study of British Defence Problems* (London: Cassell, 1965).
[99] Ibid., p.21.
[100] Ibid.
[101] Ibid., p.22.
[102] Ibid., p.21.

maritime forces), Security (comprising bases and infrastructure) and Transport (including the Merchant Navy and maritime industrial base) were defined by Roskill as 'comprising maritime power in a modern context; and each of them must be present in adequate form if the nation's maritime strategy is to be fulfilled'.[103] Gretton utilised this definition of the constituents of seapower rather than the six elements stated by Mahan, ostensibly due to a greater clarity of Roskill's definition.[104] The influence of Roskill is also apparent in Gretton's discussion of sea control; like Roskill, Gretton uses the term 'maritime zones of control' and discusses the attainment of control in terms that would not be amiss in current doctrine. The requirements and extent of maritime control needed is defined thus:

> The core of the problem of sailing a ship or ships from one port to another in war is to control the slice of water in which the ships float, as well as the air above and the depths below. Any wider degree of control is welcome but not essential, and it can be shown that with formidable opposition from aircraft and submarines, it became increasingly difficult to control any greater area than that immediately around the ships or convoys being protected...One cannot be dogmatic about zones of control and a flexible approach to the question is essential.[105]

Importantly, Gretton defined maritime strategy, as had Corbett, as not just consisting of naval forces:

> …. A maritime strategy is the method of employing all arms of all services. It should not be looked upon in any way as a purely 'naval' venture; the inter-dependence of armies, navies and air forces is total and each should integrate its efforts with complete precision if success is to be achieved.[106]

This was especially important considering the context of the British defence debate when Gretton wrote *Maritime Strategy*: that is, a period of intense rivalry and competing visions as regards the future of British military strategy. This was particularly with regard to the contrasting perspectives developed by the Royal Navy and its espousal of joint service task forces vis-à-vis the Royal Air Force's vision of an island strategy for the global deployment of RAF airpower.

The 1960s saw the publication of the final iteration of the 'first generation' of British maritime doctrine, *The Naval War Manual*. The purpose of the manual was

[103] Roskill, *The War at Sea 1939-1945*, vol.1, pp.6-7.
[104] Gretton, *Maritime Strategy*, pp.21-22.
[105] Ibid., p.23.
[106] Ibid., p.3.

principally the education of junior Naval officers.[107] The first edition of the *Naval War Manual* was promulgated in 1921 and revised in 1925, but as Professor Arthur Marder suggests, there 'was little in it beyond a few catchwords pertaining to the "principles of war" and generalities on "naval policy," the "functions of the Navy," "war plans," and so on'.[108] Significantly, the *Naval War Manual* at this stage reflected the wider debate and contrasting perspective on the centrality of offensive action against an adversary's main fleet (see chapter one, page 36). The manual placed great emphasis on the importance of offensive action in contrast to the views of, for example, Corbett, Richmond and Roskill.[109]

The manual was substantially revised in 1938 by Commander John Creswell at the Royal Naval College Greenwich;[110] Creswell represented what Till has described as the 'orthodox British line' on maritime thinking.[111] The final iteration of the *Naval War Manual*, promulgated in 1969 (superseding a 1958 version), reflected the then contemporary thinking of the British maritime school. For example, the manual defined the basis for a country's maritime strategy as: '*a*. A strong Navy. *b*. A prosperous Merchant Service [and] *c.* An efficient shipbuilding and ship repair organisation'.[112] This corresponds to Roskill's elements of seapower, subsequently utilised by Gretton. Moreover, the manual defined the defence of trade and maritime communications, power projection, and linking maritime power to wider military and national objectives as the 'fundamental aims of British maritime strategy'.[113] Further, it drew on historical experience as a guide for the development of knowledge and preparation for the future.[114]

It is also important to note the impact of Britain's changing strategic context on maritime thinking, in particular from the mid-1960s onward. Rear Admiral Richard Hill summarises this succinctly:

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[107] BR1806, *The Naval War Manual*, p.1-1.
[108] Arthur Marder, 'The Influence of History on Sea Power: The Royal Navy and the Lessons of 1914-19', *Pacific Historical Review*, Vol.41, No.4 (November 1972), pp.413-443.
[109] Gardner, 'All Sorts of War', p.157; and Till, 'Richmond and the Faith Reaffirmed', pp.113-115.
[110] Marder, 'The Influence of History on Sea Power', p.417.
[111] Till, 'Richmond and the Faith Reaffirmed', p.106.
[112] BR1806, *The Naval War Manual*, p.11-1.
[113] Ibid., p.11-2.
[114] Ibid. p.1-1; also see 'Part IV – Maritime Warfare', pp.11-1 to 19-14.

> The period when NATO topics dominated British naval thinking stretched...between 1965 and 1990. Before the earlier date, a more traditionalist and certainly more national view had prevailed. Up to the Suez debacle of 1956 Britain had taken a largely great-power attitude aspiring to the worldwide application of maritime strength, and after Suez it had quite rapidly adopted a more realistic policy aimed at containing 'brush fires'...[115]

Furthermore, this marked a period of increasing external influence on British maritime development as Britain based its national policy on being a member of and contributor to NATO. This had resulted by the late 1980s in British thinking being focused on what Hill terms 'A single scenario for conflict; force provision based upon a single threat; a "contributory" strategy, if it could be called a strategy; dubious assumptions on the likely duration of conflict; [and] a constricted and strategically unrealistic sea area...';[116] that is, operations focusing primarily on anti-submarine and surface warfare in the North-East Atlantic against the Soviet Union. The end of the Cold War in 1989-1991 and emergent security challenges in the Persian Gulf and Balkans thus marked a transition away from the aforementioned focus described by Hill and a reinvigoration for British maritime thinking, culminating with the publication of BR1806 *The Fundamentals of British Maritime Doctrine* in 1995.

The preceding discussion of the development of British maritime thought via an analysis of the respective approach and or core aspects of the thinking of key members of the British maritime school – Colomb, Corbett, Richmond, Roskill and Gretton – has sought to shed light on the principles underpinning British thinking on maritime strategy and its connection to national policy. It must be noted that the discussion has had to be necessarily selective and brief due to the range and depth of the subject. However, three key points emerge from the preceding discussion, which to varying extents and degrees of emphasis recur through the works of the above-named thinkers; a span of time covering the period from 1891 to 1965 (the dates of publication of Colomb's *Naval Warfare* and Gretton's *Maritime Strategy* respectively), and continue to feature in contemporary works.

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[115] Richard Hill, 'British Naval Thinking in the Nuclear Age' in Till (ed.) *The Development of British Naval Thinking*, pp.160-181, quotation, p.167.
[116] Ibid. p.178.

Thus, it could be argued that the following constitute enduring aspects of British maritime thought. First, the British maritime school has emphasised a maritime, rather than naval, approach to the military application of seapower. This approach places the control of maritime communications as the primary means of securing 'command of the sea' (understood in a limited sense), emphasising a pragmatic and flexible approach to utilising the sea for national purposes, in particular, the projection of power. Second, the highlighting of the link between seapower, maritime strategy and national policy, that is, an emphasis on the strategic and grand strategic utility of maritime power for Britain. Third, a recognition of the value of the study of history as a means of aiding the development of thinking and theoretical study (individually and collectively), which in turn has a practical utility.[117]

As noted in the introduction to this chapter, the purpose of doctrine is to provide a framework of principles, practices and procedures as the basis for action.[118] Having examined the principles underpinning British thinking on maritime strategy, it is to the evolution of contemporary British maritime doctrine that the chapter now turns.

The Evolution of Contemporary British Maritime Doctrine: 1995-2011

The purpose of this section of the chapter is to provide an overview of the evolution of British maritime doctrine between 1995 and 2011. In this context, doctrine includes the officially promulgated BR1806 series (*The Fundamentals of British Maritime Doctrine* and its second and third editions renamed as *British Maritime Doctrine*), the fourth edition of *British Maritime Doctrine* (published as a Joint Doctrine Publication) and associated concepts. These are the *Maritime Contribution to Joint Operations* (MCJO), *The Future Navy* and *Future Navy Operational Concept* (FNOC), the *Versatile Maritime Force* (VMF) and the *Future Maritime Operational Concept* (FMOC). The latter are included because they were either incorporated into formal doctrine (MCJO, the Future Navy and VMF) or stand alongside doctrine (that is, FMOC). This will provide the conceptual framework for the following chapters within which the subsequent

[117] See Corbett, *Some Principles*, pp.8-9 in this regard.
[118] BR1806 *The Fundamentals of British Maritime Doctrine*, p.12.

examination of the CVF programme will be undertaken, and will also illustrate the continuity of British maritime thinking, as discussed in the preceding section.

It is important to note briefly the strategic context within which *The Fundamentals of British Maritime Doctrine* was developed and the implications for the overall purpose for which it was written. The early 1990s were a period of strategic flux as the international system adjusted in response to the collapse of the Soviet Union, the end of the Cold War and increasing instability in areas such as the Balkans, the Middle East and Africa. In military terms, the changing strategic environment implied a shift away from the focus on the Euro-Atlantic theatre of operations, in particular the North German Plain and hence the North-eastern Atlantic, toward responding to crises in, for example, the Persian Gulf, that is, a shift from a static territorial defence posture to an expeditionary posture.[119] The end of the Cold War prompted a so-called 'peace dividend' that provided justification for substantial reductions in defence expenditure, including significant cuts to the Royal Navy - both in terms of manpower and equipment.[120] It also required and served to stimulate renewed conceptual thinking regarding the roles and utility of the Armed Forces in light of the evolving strategic context; the enduring constabulary operations in the Balkans and Middle East (enforcing the no-fly zones over Iraq and operations in the Persian Gulf) being the most notable examples of the changed operating environment. Furthermore, due to the collapse of the Soviet Union and with it, the Soviet Navy, Western maritime supremacy was confirmed; this in some quarters raised questions concerning the extent to which money should be spent on navies.[121] In addition, the apparent 'victory through air power' in the 1991 Gulf War and the prominence of air and ground forces in operations in the Balkans appeared to place the role of naval forces in the margins.[122] This was reflected in the British 1993 Long-term Costings process where investment in maritime capabilities, including for a dedicated Landing

[119] See Admiral Sir Jock Slater, 'The Maritime Contribution to Joint Operations', *RUSI Journal*, Vol.143, No.6 (December 1998), pp.20-24.
[120] See Eric J. Grove, *The Royal Navy Since 1815: A New Short History* (Basingstoke: Palgrave Macmillan, 2005), pp.253-257 for an overview of the implications of the end of the Cold War for the Royal Navy.
[121] See Tim Benbow, 'Maritime Power in the 1990-91 Gulf War and the Conflict in the Former Yugoslavia' in Dorman, *et. al. The Changing Face of Maritime Power*, pp.107-125, particularly p.107 for an overview of this argument and counter-argument.
[122] Ibid., p.108.

Platform Helicopter (LPH, commissioned in 1998 as HMS *Ocean*), was set against spending on the NATO Allied Command Europe Rapid Reaction Corps (ARRC) and thereby continuing the Continental Commitment.[123] The LPH did survive the process albeit set alongside the Royal Navy losing all its conventional submarines (four *Upholder*-class boats) and a reduction in escort numbers from 39 to 'about 35'.[124]

It is within this setting that the development of British maritime doctrine in the 1990s needs to be considered. This is because, as described above, the strategic context of the early 1990s could be interpreted as being unfavourable for arguing the 'maritime case'. However, due to the legacy of the latter part of the Cold War, and the need for the Royal Navy to demarcate a role for itself vis-à-vis the established roles of the Army and Royal Air Force in NATO planning,[125] and the publication in 1989 and 1991 respectively of official statements of Army doctrine (*British Military Doctrine*) and the RAF's AP3000,[126] the Royal Navy in the early 1990s initiated its own efforts to produce a doctrinal statement. A key motivation for this was the perceived forthcoming development of joint doctrine and the need for the Royal Navy to have a document available when this process began.[127] Thus, a core element underpinning the development of British maritime doctrine in the 1990s was the requirement to articulate the utility of maritime power, with a particular emphasis on its contribution at the joint level, in order to assure a Royal Navy input into the development of joint doctrine. It is in part for this reason that BR1806 was promulgated as maritime, rather than naval, doctrine; as *The Fundamentals of British Maritime Doctrine* states:

> This document is specifically concerned with the application of *maritime power*, as opposed to naval power. The difference is significant. Maritime power is *inherently joint* in nature. It emanates from forces drawn from all three Services,

[123] Grove, *The Royal Navy Since 1815*, p.255. For an overview of ARRC, and Britain's role in it, see Lieutenant General Sir Jeremy Mackenzie, 'The ACE Rapid Reaction Corps – Making it Work', *RUSI Journal*, Vol.138, No.1 (February 1993), pp.16-20.
[124] Grove, *The Royal Navy Since 1815*, p.255; and IISS, *The Military Balance 1993* (London: Routledge for the International Institute for Strategic Studies, 1993), p.63.
[125] Oliver J. Daddow, 'British Military Doctrine in the 1980s and 1990s', *Defence Studies*, Vol.3, No.3 (Autumn 2003), pp.103-113. Daddow on pp.107 and 108 briefly discusses the Royal Navy's engagement with doctrine in the 1980s and early 1990s.
[126] Grove, 'BR1806, Joint Doctrine and Beyond', p.57.
[127] Ibid., p.58.

> both sea and land based, supported by national and commercial resources, exercising influence over sea, land and air environments.[128]

This approach to the development of the Royal Navy's doctrine was successful in two respects. Firstly, and noting a drawback of the use of the term 'maritime', Grove suggests: 'There are problems in this approach as it sometimes seems to make "maritime" a single-service "dark blue" word. But it does have the advantage of making the Royal Navy's doctrine basically joint'.[129] Secondly, the emphasis on the utility of maritime power at the joint level resulted in providing, as stated by Grove, 'its authors [Professor Eric Grove and Commander Michael Codner] and the Navy in general, disproportionate leverage in the production of the first 1996 edition of *British Defence Doctrine* (*BDD*)'.[130] The objective of providing a Royal Navy input into the development of joint doctrine was achieved and this would hold longer-term significance, in particular with regard to the enunciation of an expeditionary approach to British strategy in the 1998 Strategic Defence Review that included commitment to the CVF programme. The influence of BR1806 on *British Defence Doctrine* is summarised by Grove (whilst again noting that Grove was one of authors of 1806) in the following terms:

> The dynamics of the creation of this document vindicated the architects of 1806. Not only were the authors of 1806 fully involved in its drafting (and the naval perspectives fully inputted) but Chapter 2 of 1806, 'General Concepts of Armed Conflict', proved a useful starting point for the authors of the new joint document....[131]

The emphasis on the role and utility of maritime power at the joint level would remain a core tenet of British maritime doctrine. The second edition of BR1806, renamed *British Maritime Doctrine* and published in 1999,[132] included a chapter entitled 'Summarising the Maritime Contribution to Joint Operations', which included the statement:

> Maritime force has to be regarded in a joint context in which naval assets provided are to a large degree the servants of purposes which will frequently and ultimately be executed on shore and by land forces. But *maritime manoeuvre*, the maritime contribution to this venture, offers a sensitive application of force or

[128] BR1806 *The Fundamentals of British Maritime Doctrine*, pp.13-14. Emphasis added.
[129] Grove, 'BR1806, Joint Doctrine and Beyond', p.59.
[130] Grove, 'The Discovery of Doctrine', p.188.
[131] Grove, 'BR1806, Joint Doctrine and Beyond', p.59.
[132] BR1806 *British Maritime Doctrine*, Second Edition (London: The Stationery Office, 1999).

> influence, enabling intervention at a time and place of political choice, and an opportunity to exploit the effect of joint assets. [133]

This quotation is important as it illustrates the influence on British maritime thinking of a concept originally derived from thinking on land warfare – *manoeuvre warfare*. Manoeuvre warfare seeks to:

> .... Incapacitate an enemy by disrupting his fighting system (*systemic disruption*) through the concentration of superior force against those elements of his fighting system most likely to cause the collapse of his will. Fundamentally the aim is to shatter both his moral and physical cohesion.[134]

The application of the 'manoeuvrist approach' to the maritime environment is intended to capitalise on the attributes of the maritime environment and maritime forces, namely, the ubiquitous access provided by the sea and the mobility, flexibility and leverage of sea-based forces. The reference to manoeuvre warfare also highlights a core feature of MCJO; the shift in focus from blue water operations to the littoral and the projection of power ashore.[135] The littoral is defined in BR1806 as encompassing 'The area from the open ocean which must be controlled to support operations ashore, and the area inland from shore that can be supported directly from the sea.'[136] The concept of 'Littoral Manoeuvre' subsequently evolved as a component of the *Future Navy* process alongside 'Maritime Strike' (consisting of Tactical Air Power, Land Attack Missile, Naval Fire Support and Air Manoeuvre components[137]) to form the Maritime Force Projection component of the *Versatile Maritime Force*.[138] Littoral Manoeuvre is defined as: 'The use of the littoral as an operational manoeuvre space from which a sea-based Joint amphibious force can threaten, or apply and sustain, force ashore'.[139] It must be highlighted that the definition of the littoral is flexible. For example, the opening phases of *Operation Enduring Freedom* (the US-led operation in Afghanistan in October 2001) saw US Navy and Marine Corps carrier-borne strike fighters conduct missions at ranges of 600 to 750 nautical

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[133] Ibid., p.170.
[134] Ibid., p.41.
[135] Ibid., pp.163-164.
[136] Ibid., p.163.
[137] *The Future Navy Operational Concept*, NAVB/P(01)13 (2001), p.4.
[138] BR1806 *British Maritime Doctrine*, Third Edition (London: The Stationery Office, 2004), p.206.
[139] *Future Navy – Littoral Manoeuvre Concept*, 16 May 2003.

miles from their carriers.[140] Such missions constituted 72 per cent of all combat sorties conducted over Afghanistan between 7 October 2001 and 16 March 2002 (covering the main combat phase of *Operation Enduring Freedom*)[141] and in effect, indicated that for the US Navy, the littoral could be defined as spanning 600-750 miles inland.

The utility of the MCJO concept was deemed by the Royal Navy to have been proven in operations in Sierra Leone, Afghanistan and Iraq and was thus formally incorporated into the third edition of *British Maritime Doctrine* (published in 2004), rather than constituting a stand-alone chapter as in the second edition.[142] The third edition retained the emphasis on the maritime contribution to joint operations but also included a significant amount of generic defence, rather than specifically maritime, doctrine. This was due to the third edition pre-dating contemporary joint doctrine.[143] The third edition of BR1806 was the last to be produced under the auspices of the Royal Navy's Maritime Warfare Centre; the latest fourth edition was instead developed at the Development, Concepts and Doctrine Centre (DCDC) under the auspices of the Ministry of Defence and endorsed by all three Services.[144] This transition from producing single service doctrine within the service responsible, to the development of environmental doctrine within the joint DCDC establishment, effectively marks the culmination of the process started in the early 1990s, where the Royal Navy sought to gain an *input* into the joint doctrine process alongside the Army and RAF. In essence, maritime doctrine (as well as Army and RAF doctrine) has become an *output* of the overarching joint doctrine process.

The preceding discussion has sought to firstly place the development of British maritime doctrine within the context of the evolving strategic environment and resultant debate on the roles and utility of the armed forces in the 1990s. From this the shift to the development of joint doctrine and for the Royal Navy, the emphasis within its own doctrine on MCJO as a means to secure input into joint doctrine, and the influence on maritime thinking of the land warfare derived

[140] Benjamin S. Lambeth, *American Carrier Air Power at the Dawn of a New Century*, (RAND Corporation, 2005), pp.ix-x.
[141] Ibid., p.x.
[142] BR1806 *British Maritime Doctrine*, Third Edition, p.v.
[143] MoD(UK)/DCDC, *British Maritime Doctrine*, p.vi.
[144] Ibid.

Manoeuvrist Approach, can be ascertained. This component of the analysis essentially considered the role of maritime doctrine as a contribution to higher-level thinking, that is, British defence doctrine and ultimately policy (this will be discussed in detail in chapter six which specifically examines the connection between maritime strategy and national policy). The analysis will now shift to focus on the core principles contained within the three editions of BR1806 and the extant JDP 0-10 ('Joint Doctrine Publication' and the number assigned to the current version of *British Maritime Doctrine*) and thus shed light on the evolution of British maritime doctrine from 1995 to the present.

The foundation of British maritime doctrine is provided in three chapters common to the three editions of BR1806; the structure of the fourth edition is somewhat different, employing an ends, ways, means framework, but the principles are nevertheless still present. The fourth edition of *British Maritime Doctrine* will be discussed separately below. In BR1806, the principal maritime doctrinal points are covered in 'The Maritime Environment and the Nature of Maritime Power', 'Concepts Governing the Use of Maritime Power' (retitled 'Principles Governing the Use of Maritime Power' in the third edition) and 'The Application of Maritime Power'. 'The Maritime Environment and the Nature of Maritime Power' sets out in *The Fundamentals of British Maritime Doctrine* the environmental factors affecting the use of the maritime environment, describes the nature of maritime power and discusses the attributes of maritime power. In the second edition, the chapter, whilst preserving the aforementioned outline, devotes more coverage to the environmental aspect, including more detailed discussion of the economic, political and legal dimensions. In the third edition, the socio-cultural and scientific-technological dimensions of the maritime environment are also added as is discussion of 'Operations in the Littoral'. The chapter on 'Concepts/Principles Governing the Use of Maritime Power' examines the military applications of maritime power at and from the sea, focusing on the key concepts of sea control, sea denial, fleet in being, maritime power projection, maritime manoeuvre and 'Proactive and Reactive Choices in Strategic Operational Planning'. The latter encompassed the debate on the relative merits of the offensive versus the defensive, and the need to separate the association of 'initiative' with the

'offensive'; [145] in the second and third editions of BR1806, convoy operations in the First and Second World Wars were utilised as a case study of 'The Balance of Offensive and Defensive'. In *The Fundamentals of British Maritime Doctrine*, the term 'Command of the Sea' is discussed as a stand-alone concept; in the second and third editions, it is only briefly discussed in the chapter's introduction. The US Navy derived term 'Battlespace Dominance' was also included within the three editions of BR1806 but has been removed from current doctrine. Battlespace dominance was defined as

> ...Control over the environments of the entire *battlespace*; the surface, subsurface, air, land and space environments, and the electromagnetic spectrum...The concept of battlespace dominance is useful in *joint* and littoral operations where there is a need to maintain freedom of action ashore.[146]

The omission of a section on 'Cover' in *The Fundamentals of British Maritime Doctrine* was corrected in the second edition;[147] it has remained within the subsequent iterations of *British Maritime Doctrine*. Cover is defined as 'the provision of support if required, to less powerful units or detached elements of the force that are engaged in operations of their own, taking advantage of the wider *sea control* that the main force has achieved'.[148] This quotation highlights the fundamental connection between naval and maritime power. As Till states: 'navies must strive for sea control because that facilitated the achievement of naval objectives that would in turn help secure national objectives in a *maritime* campaign or war'.[149] The concept of cover will be returned to in a subsequent chapter as a component of discussions pertaining to the debate on British maritime strategy.

Within *British Maritime Doctrine*, the discussion of cover completes the 'at sea' portion of the chapter on the 'Concepts/Principles Governing the Use of Maritime Power'; the chapter then proceeds to examine the concept of maritime power projection. The structure of the discussion of maritime power projection in *The Fundamentals of British Maritime Doctrine* and its evolution in the subsequent iterations of BR1806 warrants brief discussion. The discussion of maritime power

[145] Grove, 'The Discovery of Doctrine', p.87.
[146] BR1806 *The Fundamentals of British Maritime Doctrine*, p.69.
[147] Grove, 'The Discovery of Doctrine', p.188.
[148] BR1806 *British Maritime Doctrine*, Second Edition, p.37.
[149] Till, *Seapower*, p.153.

projection is divided into sections explaining 'The Significance of Land Warfare Concepts for Maritime Doctrine', 'Manoeuvre in Maritime Warfare', 'Manoeuvre as a Style of Warfare', 'Manoeuvre as a Style of Warfare in the Maritime Context' and 'Manoeuvre from the Sea as a Combat Function'. The sections explain both the concept of Manoeuvre Warfare and its relevance to the maritime environment; this does result in some of the content being more generic to defence (for example, the section on 'Manoeuvre as a Style of Warfare')[150] rather than specifically maritime, but as noted above, *The Fundamentals of British Maritime Doctrine* pre-dated the generic, non-environmental *British Defence Doctrine*. In the subsequent editions of BR1806, the discussion of maritime power projection focuses on the maritime dimensions of Manoeuvre Warfare, omitting 'The Significance of Land Warfare Concepts for Maritime Doctrine' and 'Manoeuvre as a Style of Warfare'. In an indication of the increasing importance of the maritime contribution at the joint level, a section on 'Manoeuvre and Joint Operations' is also included in the second and third editions of BR1806.

The third of the maritime doctrinal chapters, 'The Application of Maritime Power', addresses the range of tasks that maritime forces can undertake at and from the sea. The chapter employs an analytical framework dividing the applications of maritime power into three categories. Military or combat-governed use: 'A military use is one in which combat is used or threatened or which presupposes a combat capability. All Warfighting tasks require the military use of force'. Second, Constabulary use: '...forces are employed to enforce law or to implement some regime established by international mandate. Violence is only employed for self-defence or as a last resort in the execution of the constabulary task'. This includes tasks such as embargo enforcement, counter-piracy, and maritime counter-terrorism and counter-narcotics operations. Third, Benign use: This includes humanitarian assistance and disaster relief operations, search and rescue or disposal of ordnance; 'tasks are benign because violence has no part to play in their execution'.[151]

This framework was derived from Professor Eric Grove's previously developed 'military/diplomatic/constabulary' concept articulated in his *Future of Sea*

[150] BR1806 *The Fundamentals of British Maritime Doctrine*, p.73.
[151] Ibid., p.34.

Power.[152] Grove's 'The use of the sea' trinity was evolved from Ken Booth's earlier triangular model of the uses of the sea, articulated in his 1977 book *Navies and Foreign Policy*.[153] A major element in Grove's evolved concept was a clearer distinction, influenced by Sir James Cable, between the military and diplomatic uses of maritime power.[154] In BR1806, the military application of maritime power is divided into 'Maritime Power from the Sea' and 'Maritime Power at Sea'; the former includes nuclear deterrence and 'Combat Operations Against the Land' (for example, amphibious operations, land attack missile strikes and carrier-borne air operations); the latter is sub-divided into 'Operations against Enemy Forces' (including interdiction operations, blockade and other methods to attain sea control) and 'Protection of Maritime Trade' (including convoy, escort operations and naval control of shipping)[155]. In addition, naval diplomacy, and from the second edition onward, defence diplomacy, and peace support operations, are included as military applications. In the third edition of BR1806, the applications of maritime power were placed within the following contexts: 'The Maritime Contribution to Standing Strategic Tasks', 'The Maritime Contribution to Standing Home Commitments', 'The Maritime Contribution to Standing Overseas Commitments' and 'The Maritime Contribution to Contingent Overseas Operations'. [156] It is perhaps the case that this detailed break-down of commitments was included in the third edition, as at that time, the UK was committed to operations in Iraq (Operation *Telic*) and Afghanistan, to convey a political message regarding the Royal Navy's spectrum of operational activities and thus ensure that the Royal Navy was seen to be 'relevant' to policy-makers.

Across the three editions of BR1806, the context for maritime doctrine within the wider strategic and grand strategic setting was established prior to discussing the specifically maritime doctrine. In the first edition, due to its pre-dating *British Defence Doctrine*, this resulted in dedicated chapters on 'Security and Defence Policy' and 'General Concepts of Armed Conflict'. In the subsequent editions, a

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[152] Grove, 'BR1806, Joint Doctrine and Beyond', p.60; Eric Grove, *The Future of Sea Power* (London: Routledge, 1990), pp.232-235.
[153] Ken Booth, *Navies and Foreign Policy* (London: Croom Helm, 1977).
[154] Grove, *The Future of Sea Power*, pp.233-234.
[155] In the third edition of BR1806, the term 'Maritime Trade Operations' was introduced and 'Naval Control of Shipping' replaced with 'Naval Cooperation and Guidance for Shipping'. BR1806 *British Maritime Doctrine*, Third Edition, p.72 and p.74 respectively.
[156] See BR1806 *British Maritime Doctrine*, Third Edition, pp.59-72.

single chapter on 'Maritime Doctrine in Context' (the first chapter in both editions) was used to link maritime doctrine with wider defence policy and *British Defence Doctrine*, for example, by placing the Principles of War in a maritime context.[157]

The fourth edition of *British Maritime Doctrine*, published in 2011 as a Joint Doctrine Publication by the Development, Concepts and Doctrine Centre, follows a somewhat different approach to the previous editions. This is principally for two reasons. First, as the document has been developed as an output of the wider joint doctrinal development process centred at DCDC, there is no longer the requirement to include within *British Maritime Doctrine* a range of content that is issued separately; this includes particularly content relating to logistics and campaign planning and conduct. Secondly, the new edition of *British Maritime Doctrine* utilises an ends, ways, means framework, thus resulting in the document being distilled into three chapters rather than the nine chapters (plus the bibliographical essay 'From Trafalgar to Today: A Bibliographical Essay on Doctrine and the Development of British Naval Strategic Thought')[158] of the third edition. Chapter one summarises the ends for British maritime power; this is placed within the context of UK national interests and the strategic maritime environment and follows on from the October 2010 National Security Strategy and Strategic Defence and Security Review (SDSR).[159] Chapter two considers the ways in which maritime power functions. This includes an overview of the attributes of maritime power and examines the roles of maritime power utilising a new framework replacing the military, constabulary and benign roles-based construct of BR1806. The three roles defined in the current edition of *British Maritime Doctrine* are: war-fighting; maritime security; and international engagement. The former two are essentially consistent with the earlier military and constabulary roles; the latter, international engagement is defined as: 'British maritime forces, working with partners, exert power and influence in support of national political objectives with the aim to prevent conflict by deterring, coercing, stabilising and reassuring others in time of crisis'.[160] International

[157] For example, see Ibid., pp.8-14.
[158] Ibid., pp.211-228.
[159] MoD(UK)/DCDC, *British Maritime Doctrine*, p.vii.
[160] Ibid., p.2-21.

engagement includes such tasks as conflict prevention, nuclear and conventional deterrence, reassurance, coercion, containment, providing presence and maritime stabilisation operations.[161]

The principles governing the use of maritime power at and from the sea are included under the heading 'war-fighting' and are consistent with BR1806. The section on maritime power projection and its contribution to joint operations has been tabulated and uses the following headings: 'Shape', 'Reassure', 'Deter', 'Coerce', Disrupt', 'Project', 'Support', 'Limit' and 'Recover'.[162] Chapter three considers the means by which maritime capability is delivered. It is divided into three sections covering the conceptual, moral and physical components. Previously, these aspects of maritime doctrine were also covered in a dedicated chapter entitled 'Maritime Combat Capabilities', Maritime Operational Capability' or 'Maritime Fighting Power and Operational Capability' in the first, second and third editions respectively. This chapter includes under the 'Force Structure' heading, the force generation requirements established in the SDSR replacing the aforementioned maritime contribution to specific tasks outlined in the third edition of BR1806. The SDSR force components consist of three major elements. First, the Committed Force, comprising 'those force elements required to meet the non-discretionary elements of the *National Security Strategy*...For the Royal Navy this includes submarines, surface ships, aircraft, marines and support units and ships that are globally deployed on operations...' Second, the Responsive Force, which comprises 'those force elements that are required to respond to the full range of demands for which the UK should be prepared'. This includes 3 Commando Brigade Royal Marines. Thirdly, the Adaptive Force, which comprises 'those force elements that routinely, are neither attributed to the *committed* nor *responsive force*'. This includes those assets 'recently returned from operations, are generating for operations or are in an extended maintenance period and are at a lower readiness'.[163]

[161] See Ibid. pp.2-22 to 2-28 for full discussion of the tasks under the 'international engagement' role.
[162] Ibid., pp.2-14 to 2-15.
[163] Ibid., p.3-13.

The 'Responsive Force' includes the 'Responsive Force Task Group' that the Royal Navy is required to provide under the SDSR.[164] The Response Force Task Group replaces the previously separate Carrier Strike Task Group and Amphibious Task Group and is intended to provide a hybrid power projection capability (that is, carrier strike and littoral manoeuvre), especially from when the Carrier Enabled Power Projection capability is established.[165] The Carrier Enabled Power Projection concept will be examined in more detail in the next chapter.

In order to link this chapter with the following chapters examining the CVF programme, it is useful to note the doctrinal context within which the development of the ships, and the associated joint combat aircraft variant debate (concerning the fast jet component of the ship's planned air group), took place. Having already established the shift in focus for British maritime thinking in the 1990s from Cold War scenarios to expeditionary operations, in particular in the littoral and the incorporation into doctrine of the *Maritime Contribution to Joint Operations*, mention of the Royal Navy's forward-looking conceptual thinking – *The Future Navy* and *Future Navy Operational Concept* – is required. The *Future Navy* articulated the Navy Board's 'strategic concept for the future naval service',[166] and this informed the operational-level *Future Navy Operational Concept*.[167] Both documents were developed in 2000-01[168] and were incorporated into the third edition of BR1806. The overarching strategic vision articulated in *The Future Navy* centred on the concept of a *Versatile Maritime Force* which:

> ... is optimised for Joint power projection, assured access to the theatre of operations for the Joint force, Joint rapid effect, and information superiority, but able to play its part in all types of conflict... has the global reach, sustainability and endurance required to operate in the geographic regions identified in UK defence policy... can provide suitably configured maritime capabilities able to contribute at the different scales of effort required by MoD planning assumptions... is fully interoperable with the Future Army, Future Air Force, and other national and international military and civil partners likely to be encountered in the joint, combined or integrated operations envisaged in UK defence policy...[169]

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[164] Ibid.
[165] Ibid., p.3-17. Note in *British Maritime Doctrine*, the terms 'Responsive' and 'Response' are used to describe the task group.
[166] *The Future Navy*, Admiralty Board Paper 2/00 (2000).
[167] *The Future Navy Operational Concept*, p.2.
[168] Grove, 'The Discovery of Doctrine', p.190.
[169] *The Future Navy*, p.4.

The Future Navy also introduced an 'enabling concept' for the VMF: 'Swing...the ability to configure a force, formation or unit to allow it to operate successfully, and cost effectively, across a range of mission types and roles'.[170] 'Swing' would be based on a number of components, including adaptability, configurability, standardisation, simplicity of operation and information superiority;[171] the aircraft carrier was cited as a 'definitive example' of configurability ('the ability to configure a unit to suit strategic, operational or tactical imperative').[172] The vision articulated in *The Future Navy* provided the basis for the operational-level *Future Navy Operational Concept*, which had the purpose of describing *how* the Royal Navy will fight and the four core maritime capabilities that it would contribute to a future joint campaign.[173] Those four capabilities were defined as: power projection (including maritime strike and littoral manoeuvre), flexible global reach, optimised access (based on sea control in both open waters and the littoral) and C4ISR.[174] It is in this context provided by *The Future Navy*, *The Future Navy Operational Concept* and the VMF that Royal Navy thinking on the roles and utility of the future aircraft carriers, and wider capability development, needs to be considered, especially in light of their importance to the Future Navy,[175] and will be examined in detail in the following chapters.

Conclusion

The purpose of this chapter has been to provide an overview of the development of contemporary British maritime thinking and doctrine and the longer-term historical context from which it has emerged. This was in order to highlight the enduring themes and ideas within British maritime thinking and to deduce the influence of such thinking on contemporary doctrine. From the above analysis, both historic and contemporary, the following emerge as enduring tenets of British maritime strategic thought. First, an emphasis on the *maritime*, rather than *naval*,

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[170] Ibid.
[171] Ibid., p.5.
[172] Ibid.
[173] *The Future Navy Operational Concept*, p.2.
[174] Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance; Ibid., p.7.
[175] C. P. R. Montgomery, 'The Royal Navy and Future Joint Operations', *RUSI Journal*, Vol.147, No.2 (April 2002), pp.68-72. At the time of writing this article (2002), Montgomery was a Captain and Assistant Director (Strategy) at the Naval Staff Directorate, MoD. He ultimately achieved the rank and position of Vice Admiral and Second Sea Lord respectively.

approach to the military application of seapower and the contribution of maritime power to joint operations. That is, the utility of maritime power as a strategic instrument of national policy. Second, a pragmatic and flexible conception of sea control which is viewed as a means to an end – the exploitation of maritime communications to enable the projection of power ashore. In this regard, a member of the team at DCDC that developed the fourth edition of *British Maritime Doctrine* stated that the 'core imperative [for the Royal Navy]: [is] to attain the necessary *degree* of sea control to enable hard-edged combat operations and day-to-day international engagement and influence'. [176] Finally, the recognition of the importance of the study of history as the basis for the analysis and interpretation of experience and the development of knowledge and understanding; both of which are the foundation for the development of effective doctrine.[177]

The development of the British approach to, and thinking on, maritime strategy highlights the connection between national context and conceptions of seapower. In summary, due to Britain's historic position, in particular in the latter half of the 19th and early 20th centuries, as the preeminent maritime power, British thinkers, such as Admiral Colomb and Sir Julian Corbett, could consider *how* to exploit British naval strength, for example, to enable expeditionary operations, following the defeat of lesser naval forces. In contrast, those states with relatively weaker naval capabilities would develop their thinking regarding the exploitation of seapower along different lines. In this regard, the French *Jeune Ecole* of the nineteenth century and German thinkers of the twentieth sought to exploit *guerre de course* – commerce warfare – as a means to offset British maritime superiority.[178] In addition, the examination of the historical application of British maritime power and its relation to national policy, enabled thinkers such as Corbett and Admiral Sir Herbert Richmond to develop the notion of a 'British Way in Warfare' and to emphasise the utility of maritime forces to British national strategy. This has an enduring relevance as indicated by the focus on the maritime contribution to joint operations in contemporary British maritime doctrine.

[176] Interview with Commander James Hayle, Royal Navy, Shrivenham, 18 November 2010.
[177] Lambert, 'The Royal Naval College, Greenwich and Doctrine Development Down to BR1806', pp.52-54.
[178] See Till, *Seapower*, pp.68-71.

This chapter has been concerned with British thinking on the roles and utility of maritime power and its translation into doctrine in order to provide that 'framework of principles, practices and procedures' underpinning and guiding the development of British maritime capabilities. From 1995 and the publication of the first edition of BR1806, the Royal Navy has sought to articulate a coherent strategic statement concerning the roles, application and utility of British maritime power and its contribution to national policy. It has also sought to outline a strategic vision for the future development of Britain's maritime capabilities and how they would contribute to Britain's future national policy requirements in a dynamic strategic environment. At the core of the future maritime force vision are the two new aircraft carriers of the *Queen Elizabeth*-class, the design of which was significantly influenced by the developing emphasis on maritime power projection, within the context of the MCJO, discussed in this chapter. The following three chapters will consider the rationale for their development, potential alternatives, and the debate concerning their utility and the implications of their acquisition for British national policy.

3. The Rationale for the Future Aircraft Carrier Programme

Introduction

The purpose of this chapter is to examine the rationale for the development and acquisition of what became the *Queen Elizabeth*-class aircraft carriers. In order to do this, the chapter will first briefly examine the Royal Navy and its historical engagement with carrier airpower; it then proceeds to consider the strategic rationale for carrier airpower, examining its roles, utility and contribution to national policy. Proceeding from this, the chapter examines the evolution of British thinking on the development of a replacement for the *Invincible*-class aircraft carriers, that is, the evolution of the Future Aircraft Carrier (CVF) programme. The development of British thinking on a replacement aircraft carrier capability, in particular between 1996 and 2002, illustrates effectively the changing trajectory of wider British maritime doctrine – as discussed in the preceding chapter – from a focus on sea control, in particular anti-submarine warfare (ASW), operations in the North Atlantic to expeditionary power projection operations, as conceptualised in the *Maritime Contribution to Joint Operations*.[1] Conversely, the direction of policy adopted by the British government since 2010, especially toward maritime airpower (and amphibious capabilities), reflects an increasing divergence between national policy and maritime strategy with significant implications for the capability and credibility of British maritime airpower.[2]

This chapter is also the first of three chapters that focus on the debate concerning the development and acquisition of Britain's future aircraft carriers. In this regard, the purpose of this chapter is to examine both in theoretical terms and with reference to historical experience, the strategic roles and utility of aircraft carriers

[1] BR1806 *British Maritime Doctrine*, Second Edition (London: The Stationery Office, 1999), specifically chapter nine.
[2] The term 'maritime' in relation to airpower is used in this thesis to refer to both land and sea-based aviation operating in support of maritime operations; in contrast, the term 'naval' will be used with regard to carrier-based aviation.

in order to inform the analysis of the rationale underpinning Britain's decision to invest in the *Queen Elizabeth*-class. Chapter four will examine the design and development of the carriers and debate on the variant of fixed-wing aircraft to be embarked: whilst chapter five will consider potential alternatives to the aircraft carrier and the role of maritime aviation within wider British airpower.

Central to this chapter and those following, is the question: what is the utility of an aircraft carrier? This question is important because in order to determine the relevance and whether or not there is a need for an aircraft carrier, its utility must be understood. In this light, the state of public debate in the UK concerning its maritime capabilities, in particular aircraft carriers, warrants concern. This is highlighted by Tim Benbow with regard to the debate ahead of the 2010 Strategic Defence and Security Review:

> Even the Prime Minister and some senior military officers publicly professed not to know what aircraft carriers were useful for.... The principal gap in knowledge that became so painfully evident was the remarkable lack of awareness of the options that aircraft carriers and amphibious forces provide to policy-makers. This blind spot is disappointing and in stark contrast to the approach of states such as the United States, France, Italy and Spain, not to mention India and China.[3]

The 'remarkable lack of awareness' concerning the utility of aircraft carriers has direct strategic implications for the development of British maritime airpower, most notably seen in the British government's decision to reduce the fixed-wing component of the planned *Queen Elizabeth*-class air-group to 12 aircraft (from 36; the air-group could, contingent on funding and the availability of trained personnel, be expanded in future), to switch from a catapult-assisted take-off but arrested recovery (CATOBAR) configuration for the aircraft carriers to a short take-off and vertical landing (STOVL) configuration and a commitment at present to operating a part-time carrier capability with only one ship being operational. The Royal Navy has accumulated substantial, and at times world-leading, experience of aviation operations at sea. This provides a valuable source of historical knowledge to inform contemporary debates, whilst also highlighting the utility of carrier airpower to British national policy.

[3] Tim Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships: 1945-2010', *Corbett Paper* No. 9 (The Corbett Centre for Maritime Policy Studies, March 2012), p.1.

The Royal Navy and Carrier Airpower: A Brief Overview

The purpose of this section is to highlight key points in the development of Britain's use of carrier-based airpower. It is not intended to provide an account of the history of British maritime airpower and is necessarily brief and selective.[4] Rather, the key points to be highlighted, for example, the inter-war period of Dual Control and the debate concerning the requirements of British airpower in the 1960s, are central to understanding the British debate on the roles and utility of carrier airpower. Situated alongside the debate on the roles and utility of carrier airpower, is the enduring debate on its ownership; that is, whether the Royal Air Force (RAF) should be responsible for all British airpower, or whether, due to the unique requirements of operating within the maritime environment, the Fleet Air Arm constitutes an indivisible component of the Royal Navy. The debate on ownership will be discussed in-depth in chapter five; however, aspects of the analysis in this chapter touch upon this issue and will be highlighted where appropriate.[5]

The Royal Navy commenced its first experiments involving aircraft in 1903 with tethered man-carrying kites.[6] This was followed by an interest in airships, most notably marked by the signing of a contract for the Royal Navy's first airship on 7

[4] The following provide a valuable and diverse account of the development of British maritime airpower: Tim Benbow (ed.), *British Naval Aviation: The First 100 Years*, (Farnham: Ashgate, 2011); Tim Benbow, 'The Post-1945 Struggle for Naval Aviation', Eric Grove, 'The Naval Aviation Controversy 1919-1939', and Captain Jeremy Stocker, RNR 'Full Circle: *Queen Elizabeth* to *Invincible* and Back Again' all in Peter Hore (ed.), *Dreadnought to Daring*: *100 Years of Comment, Controversy and Debate in The Naval Review* (Barnsley: Seaforth, 2012); Nick Childs, *The Age of Invincible: The Ship That Defined the Modern Royal Navy* (Barnsley: Pen and Sword Maritime, 2009); Christina J. M. Goulter, *A Forgotten Offensive: Royal Air Force Coastal Command's Anti-Shipping Campaign, 1940-1945* (London: Frank Cass, 1995); Eric Grove, *Vanguard to Trident: British Naval Policy Since World War II* (London: Bodley Head, 1987); David Hobbs, *A Century of Carrier Aviation: The Evolution of Ships and Shipborne Aircraft* (Barnsley: Seaforth, 2009); and *British Aircraft Carriers: Design, Development and Service Histories* (Barnsley: Seaforth, 2013), Lt Cdr Peter Kemp, *Fleet Air Arm* (London: Herbert Jenkins, 1954); Stephen Roskill, *Naval Policy Between the Wars, Volume I: The Period of Anglo-American Antagonism 1919-1929* (London: Collins, 1968) and *Naval Policy Between the Wars, Volume II: The Period of Reluctant Rearmament 1930-39* (London: Collins, 1976); and Geoffrey Till, *Air Power and the Royal Navy 1914-1945* (London: Jane's, 1979).

[5] For a valuable account of the wider debate concerning the need for an independent air force, including its roots in the First World War, see Eric Grove, 'The Case for the RAF' in in Michael Codner and Michael Clarke (eds.), *A Question of Security: The British Defence Review in an Age of Austerity* (London: I. B. Tauris, 2011).

[6] Eric Grove, 'Seamen or Airmen? The Early Days of British Naval Flying', in Benbow (ed.), *British Naval Aviation*, p.8.

May 1909 – the official 'beginning' of British naval aviation.[7] The Royal Navy commissioned its first aircraft (albeit seaplane) carrier, HMS *Hermes*, on 7 May 1913; the ship was intended to evaluate whether it was possible for aircraft to operate with the fleet under operational conditions.[8] This was one aspect of a larger, pro-active effort to research and develop the potential of maritime aviation,[9] the results of which were summarised by Lieutenant Commander Peter Kemp, Royal Navy as follows:

> It was naval pilots who practised and evolved a workable method of bombing, who experimented with wireless transmitters in aircraft, who first attempted to fit machine-guns in aeroplanes. It was their zeal and enthusiasm, backed up by an adventurous and far-seeing First Lord, which had produced the finest aerial fighting force in the world by the time the war clouds burst over Europe in 1914.[10]

The Royal Naval Air Service (RNAS)[11] was moreover, as Dr Christina Goulter, Senior Lecturer in the Defence Studies Department, King's College London at the Joint Services Command and Staff College, argues:

> ... materially, and perhaps psychologically, better prepared for its particular tasks than its military counterpart. Once the war started, the gap widened, and the most striking contrast was in the area of solving operational problems, especially those related to equipment. While there was little attempt made by RFC [Royal Flying Corps] heads to rectify many tactical and technical shortcomings, the RNAS had by 1918 identified, and made considerable progress towards solving, the chief difficulties involved in long-range maritime air operations.[12]

It does warrant mention though that, in some respects, the RNAS was becoming a nascent *air force* within the Admiralty, rather than a fleet air arm.[13] The Royal Navy had established a particularly strong position with respect to the development of a nascent aircraft carrier force, operating at the time of the Armistice a force of six seaplane or aircraft carriers with two more vessels (*Eagle*

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[7] Ibid., p.10.
[8] David Hobbs, *A Century of Carrier Aviation: The Evolution of Ships and Shipborne Aircraft* (Barnsley: Seaforth, 2009), pp.28-29.
[9] See, for example, Grove, 'Seamen or Airmen?' and 'Air Force, Fleet Air Arm – or Armoured Corps? The Royal Naval Air Service at War' in Benbow (ed.), *British Naval Aviation*; Kemp, *Fleet Air Arm*; Till, *Air Power and the Royal Navy 1914-1945*; and Goulter, *A Forgotten Offensive* (especially chapter one, 'Lessons Learned: The First Maritime Aviation Experience') for accounts of the development of British maritime aviation before and during the First World War.
[10] Kemp, *Fleet Air Arm*, p.23.
[11] This thesis follows the convention set out by Till in *Air Power and the Royal Navy 1914-1945*, that for clarity, the Royal Navy's air component is referred to as the Royal Naval Air Service for the period up to 1918, or as the Fleet Air Arm (FAA) from 1918 onwards, whilst noting that the FAA was officially created in 1924 and technically ended with the post-Inskip return of it to the Royal Navy in 1939, before re-emerging in 1953. Till, *Air Power and the Royal Navy*, p.9.
[12] Goulter, p.9.
[13] Grove, 'Air Force, Fleet Air Arm – or Armoured Corps?', p.33

and *Hermes*, the first purpose-built aircraft carrier) expected in service by the end of 1919.[14] In addition, discussions were underway regarding the possible conversion to aircraft carriers of the cruisers *Glorious* and *Courageous*.[15] Professor Geoffrey Till summarises the Royal Navy's position in 1918 thus: '...At a time when no other naval power had a single aircraft or seaplane carrier, the Royal Navy was planning the eventual disposition of no less than 10 of these revolutionary vessels'.[16] However, the creation of the Royal Air Force, via the amalgamation of the RNAS and Royal Flying Corps (RFC), in April 1918, would have significant implications for the development of British maritime airpower.[17] As Goulter highlights, with reference to the disparity in size between the RNAS and RFC:

> With the amalgamation, the Admiralty's influence on aviation reduced radically, and there was nothing to replace the naval tradition of heavy investment in research and development. An examination of the extent of the RFC's advances compared with those of the RNAS during the war demonstrates just how serious were the consequences of the amalgamation, especially for maritime aviation.[18]

Further, as Till suggests, citing Admiral of the Fleet Sir Caspar John, a former Fleet Air Arm officer and First Sea Lord (1960-1963):

> "The basic reason for the Admiralty ... failings ... was the emasculation of the Navy on April 1, 1918, when the bulk of its air knowledge went to the RAF, and took all too long to replace..." Deprived of its leadership at the top, naval aviation for many years lacked the bureaucratic muscle needed to push for the kind of progress and expansion that would have made the sceptical think again.[19]

The placing of Britain's maritime air assets under the control of the RAF, and in the case of naval aviation from 1924 under the 'Dual Control' of the Admiralty and RAF, served as a fundamental constraint on the development of naval and wider maritime aviation.[20] The RAF's core *raison d'être* was strategic bombing,

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[14] Till, *Air Power and the Royal Navy*, p.60.
[15] Ibid.
[16] Ibid.
[17] The RFC was the preponderating influence in the newly created Royal Air Force. This is illustrated by the respective size of the RNAS and RFC at the point of amalgamation; the former consisting of some 55,000 officers and men, the latter in excess of 200,000. Goulter, p.22.
[18] Ibid.
[19] Till, *Air Power and the Royal Navy*, p.189.
[20] For an account of the implications for naval aviation and the inter-war period in general, see Till, *Air Power and the Royal Navy, 1914-1945*, Stephen Roskill, *Naval Policy Between the Wars, Volume I: The Period of Anglo-American Antagonism 1919-1929* (London: Collins, 1968) and *Naval Policy Between the Wars, Volume II: The Period of Reluctant Rearmament 1930-39* (London: Collins, 1976); and for wider maritime aviation, see Goulter, *A Forgotten Offensive*. For

and to a significant extent, other roles such as the provision of maritime airpower were seen as unnecessary diversions.[21] Dr Peter Gray, then a Group Captain and Director of Defence Studies (RAF), explained the significance of strategic bombing thus:

> As post-Great War budgets were slashed, the RAF needed its own, distinct role. If air power was primarily in support of land and naval forces, assets could be redistributed with an appropriate saving in organisation costs – and then the junior service would probably be allowed to wither on the vine. The strategic bombing role offered both a lifeline for the RAF and a cudgel with which to beat sister services in the scrimmage for funding. As this was a continuing process, the concept of strategic bombing became embedded in the RAF psyche, particularly under the charismatic leadership of 'Boom' Trenchard.[22]

The perceived utility of strategic bombing was articulated in the RAF's principal doctrinal publication, *AP1300 Royal Air Force Manual – Operations*, in the following terms: 'The bombardment of the most vital and vulnerable of these centres may be more effective and decisive than the direct attack on naval and military forces'.[23] Moreover, the RAF, being then (as it is now) a principally land-based organisation, lacked sufficient familiarity with the requirements of operations at and from the sea. Kemp explains the question at the centre of the inter-war debate on ownership of naval aviation thus:

> It was the use to which it could be put in the naval field as adjunct of sea power and a new element of naval strategy. Sea power, for all its immense and devastating strength, is a delicate instrument finely balanced, and in its exercise it calls for an expert touch, acquired only after years of training and experience. To try and graft a powerful new weapon on to so intricate a growth without expert knowledge and guidance was certain to end in confusion or chaos, and it was only the Admiralty that could supply that expert knowledge and guidance.[24]

The enacting of an agreement in 1924 between the Deputy Chief of the Naval Staff, Admiral Sir Roger Keyes and the Chief of the Air Staff, Lord Trenchard – the Trenchard-Keyes Agreement – effectively laid the foundations for the Dual Control system.[25] The purpose of this agreement was to implement the Balfour

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the RAF perspective, see Goulter, *A Forgotten Offensive* and John Terraine, *The Right of the Line: The Royal Air Force in the European War 1939-45* (London: Hodder and Stoughton, 1985).

[21] For example, see Goulter, pp.38-42.

[22] Peter Gray, 'Air Operations for Strategic Effect – Theory and Practice in Kosovo', *Air Power Review*, Vol.3, No.1 (Spring 2000), pp.16-31, quotation p.18.

[23] Ministry of Defence, *AP1300 – Royal Air Force Manual – Operations* (July 1928), Chapter VIII, para 4, cited in Group Captain Christopher Finn, 'British Thinking on Air Power – The Evolution of AP3000', *Air Power Review*, Vol.12, No.1 (Spring 2009), pp.56-67.

[24] Kemp, p.104.

[25] Till, *Air Power and the Royal Navy*, p.40.

Report (deriving from the Balfour Subcommittee convened in 1923) which established that the Admiralty would pay for the Fleet Air Arm (FAA), that it would receive what it required from the Air Ministry and that all observers and 70 per cent of pilots were to be naval although the latter would be attached to the Royal Air Force (but remain in naval uniform).[26] Although the Trenchard-Keyes Agreement would increase the naval component of the FAA, it would until 1937, remain under the authority of the RAF. The return of the FAA to Admiralty control, the Inskip Award, was achieved following an inquiry by Sir Thomas Inskip, the Minister for the Co-ordination of Defence, the findings of which were announced in Parliament on 30 July 1937.[27] The transition from Royal Air Force to Royal Navy control was completed in 1939.[28]

The implications of nearly two decades of RAF/Dual Control for British naval aviation are expressed succinctly by Till:

> By 1939 the Royal Navy had yielded the race to develop air power at sea to the US and Japanese navies. Where they both deployed over 600 front-line aircraft at sea, the British could only manage some 230. Such low numbers encouraged the development of relatively inefficient multi-purpose aircraft, weakened the performance of the FAA over the whole range of its activities, and made it particularly difficult for naval aviation to make that quantum jump from being a supportive, ancillary weapon of the Fleet to being a dominant and even decisive one.[29]

It is beyond the scope of this chapter to examine the FAA's performance in the Second World War; however Kemp provides the following summary of key lessons emanating from that conflict:

> The first, and overriding, aspect of naval aviation that emerged from the war was that it was not a service apart, an air component of the Navy, but an integral part of it, extending the range and efficiency of sea power as exercised by the ships of the fleet. The two classic examples of this... were the battle of Cape Matapan and the hunt of the *Bismarck*.... Equally important was the provision of close fighter support of fleets, squadrons, and convoys at sea. This lesson was most painfully and expensively learned off Malaya in the sinking of the *Prince of Wales* and the *Repulse*.... We learned, too, that carrier-borne aircraft brought with them the ability to mount attacks on the enemy in places where he least expected it, and to cover assaults designed to further the land operations of the Army.... In these operations it

[26] Ibid., p.38.
[27] Till, *Air Power and the Royal Navy*, p.54.
[28] Eric Grove, 'The Naval Aviation Controversy 1919-1939', pp.113-127.
[29] Ibid., p.187.

> was the presence of the carrier which made possible the assaults from the sea, since the chosen theatres of operation were beyond the range of shore-based fighters.[30]

The FAA ostensibly entered the post-war period in a strong position, operating on paper, a numerically impressive force of wartime aircraft carriers and having under construction four *Hermes*-class light fleet and two *Eagle* (ex-*Audacious*) class fleet carriers.[31] However, the long-term prospects for the FAA were less certain. This was principally due to three factors; the parlous economic situation confronting Britain in the late 1940s and 1950s; the advent of atomic and nuclear weapons and the implications for warfare and strategy; and the development of jet aircraft and their impact on carrier design and operations.[32] Moreover, in 1950, the Chief of the Air Staff, Marshal of the Royal Air Force Sir John Slessor attempted to revisit the debate on ownership of naval aviation, by proposing in a letter to the First Sea Lord, Admiral of the Fleet Lord Fraser, the merger of RAF Coastal Command and the Fleet Air Arm to form a joint Maritime Air Force.[33] The 1950s would also see a sustained attack on the roles and utility of the FAA under the auspices of the Radical Review, held from 1953 to 1955.[34] This process would, as with debates held before and since, address issues such as the cost effectiveness of carrier airpower, whether the Royal Air Force could fulfil maritime air roles instead of the Royal Navy and the utility of carriers to British national policy.[35]

The 1960s marked both the high and low points of British carrier airpower. The former illustrated by the (excluding comparison with the US Navy) formidable force of five strike carriers - *Ark Royal*, *Eagle*, *Victorious*, *Centaur* and *Hermes* - that formed the core of the Royal Navy.[36] The latter, the Labour government's decision in 1966 to cancel the planned first of a new class of medium (53,000 tons) aircraft carriers, CVA-01,[37] and withdraw from service the existing ships.

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[30] Kemp, pp.214-215.
[31] Grove, *Vanguard to Trident*, p.16.
[32] Tim Benbow, 'British Naval Aviation and the "Radical Review", 1953-55', in Benbow (ed.), *British Naval Aviation*, pp.125-150.
[33] Grove, *Vanguard to Trident*, p.66.
[34] For an account of the Radical Review, see Benbow, 'British Naval Aviation and the "Radical Review"'.
[35] Ibid.
[36] Grove, *Vanguard to Trident*, p.255.
[37] The name *Queen Elizabeth* was informally approved by Her Majesty The Queen but was not to be promulgated until the contract for the ship was placed. Tim Benbow, 'Introduction', in Benbow (ed.), *British Naval Aviation*, pp.1-6, specifically, p.4. Edward Hampshire, 'The Battle for CVA01', in Benbow (ed.), *British Naval Aviation*, provides a most useful account of the CVA-01 debate and outcome.

The run-down of the existing carrier force occurred rapidly through the late 1960s and early 70s; the last carrier to remain, *Ark Royal*, remained in service until 1978, operating an air group of 12 Phantom fighter, 15 Buccaneer strike aircraft, four Gannet airborne early warning (AEW) aircraft and seven Sea King anti-submarine warfare (ASW) helicopters.[38] HMS *Hermes* was retained in service as a commando carrier, that is, only capable of operating rotary wing and short take-off/vertical landing (STOVL) aircraft (a role fulfilled commendably in the 1982 Falklands War).

Concurrent with the development of CVA-01 was work to develop a new escort cruiser with a significant embarked helicopter capability (originally intended to be nine Wessex ASW).[39] This programme survived the cancellation of CVA-01, and evolved through the late 1960s into a Through Deck Command Cruiser (TDCC) capable of operating helicopters and STOVL aircraft, the latter at that stage, envisaged to be Royal Air Force Harriers. The Harrier entered service with the Royal Air Force in 1969 and in the same year conducted trials from both the cruiser HMS *Blake* and the carrier HMS *Eagle*, which led to official approval for RAF Harriers to operate at sea.[40] These were followed in 1971 by additional trials on-board HMS *Ark Royal* to test the concept of carrier-based Harrier operations.[41] The Royal Navy had also been pursuing work on a 'maritime support' version of the Harrier and in November 1972, the Harrier manufacturer, Hawker Siddeley, received a contract to undertake a study into a 'Sea Harrier' for fighter, reconnaissance and strike duties with the Fleet Air Arm.[42] The contract for the first TDCC – *Invincible* - was placed in April 1973; economic circumstances delayed an order for the Sea Harrier, which was finally placed in May 1975.[43] HMS *Invincible*, the first of three *Invincible*-class vessels (the other two being *Illustrious* and *Ark Royal*), was commissioned in 1980 with an air group of nine Sea King ASW helicopters and five Sea Harriers. HMS *Hermes* had also been

[38] Grove, *Vanguard to Trident*, pp.310-311.
[39] Ibid., p.317.
[40] Ibid., p.319.
[41] Ibid.
[42] Ibid., p.320.
[43] Ibid., pp.320-321; and Nick Childs, *The Age of Invincible: The Ship That Defined the Modern Royal Navy* (Barnsley: Pen and Sword Maritime, 2009), p.50.

retained and re-configured as an ASW carrier, with Sea Harrier capability pending replacement by *Illustrious*.[44]

In contrast to the current decade-long gap in carrier capability and its concomitant impact on the entire system of generating credible naval aviation, the transition at the end of the 1970s and early 1980s from conventional carrier operations to STOVL operations took place with the benefit of an existing active cadre of Royal Navy aircrew and support personnel well-versed and experienced in carrier air operations. The *Invincible*-class provided a very limited fixed-wing capability (originally intended mainly to counter shadowing Soviet maritime reconnaissance/strike aircraft) especially when compared to the broader capability across the whole range of roles of the old *Ark Royal*. For example, the Sea Harrier FRS1, in contrast to the Phantom, lacked a beyond visual range air-to-air missile capability (rectified in the 1990s with the FA2 variant), lacked the strike capability of the Buccaneer, and as demonstrated in the Falklands War, *Invincible* (and *Hermes*) then lacked an AEW capability. This was subsequently remedied via the development of a specialist Sea King variant. However, the *Invincible*-class/Sea Harrier combination did enable the FAA to maintain a fixed-wing naval aviation capability and one that provided a credible, albeit small-scale, capability. This issue will be discussed in more detail below with respect to the rationale for developing CVF. The *Invincible*-class remained in service as fixed-wing carriers until 2010, when the Coalition government as part of its Strategic Defence and Security Review (SDSR), ordered the immediate withdrawal from service of the Harrier and the *Ark Royal*. Thus, for the first time in nearly a century, Britain lost the capability to deploy fixed-wing aircraft at sea, albeit with the commitment that at least one of the two *Queen Elizabeth*-class carriers under construction, would enter service sometime in the 2020 timeframe.

The Strategic Rationale for and Utility of Carrier Airpower[45]

The core purpose of carrier airpower is to provide affordable, independent and strategically credible deployable airpower.[46] The utility of aircraft carriers reflects

[44] Grove, *Vanguard to Trident*, p.323 and p.352.
[45] The analysis in this section has also been published in, James Bosbotinis, 'The Future of UK Carrier Strike: The Strategic Implications of the F-35 Variant Decision', *RUSI Journal*, Vol.157, No.6 (December 2012), pp.10-17.

the broader utility of maritime power. The ability to utilise the sea as a means of communication and access, provides maritime forces with the ability to exploit a manoeuvre space encompassing 70 per cent of the earth's surface, free from restriction (the high seas are a global commons and warships have the right of innocent passage through international straits and archipelagic waters). Moreover, 80 per cent of the world's population live within 80 nautical miles of the coast and is thus susceptible to influence from the sea.[47] The key attributes of access, mobility, versatility, sustainability and leverage enable maritime forces to exercise influence via a forward presence on a sustained basis.[48] The aircraft carrier adds to this the ability to provide organic airpower, independent of access, basing and over-flight issues, whilst moving up to 500 miles a day, in support of national interests. The utility of organic airpower was alluded to in AP3000 *British Air and Space Power Doctrine* as:

> .... Enabling joint ... campaigns to be conducted, particularly by guaranteeing freedom of manoeuvre through control of the air ... British air [and space] power underpins the United Kingdom's capability to conduct deep operations, influencing events and behaviours anywhere, and at any time.[49]

It warrants mention that the above quotation referred to the value of airpower in generic, and principally land-based terms. AP3000 was Royal Air Force-led and devoted very little attention to sea-based airpower; the extant air doctrine, *UK Air and Space Doctrine*, in contrast, devotes significantly more attention to the utility of carrier-based aviation.[50]

The utility of and rationale for carrier airpower was recognised in the 1998 Strategic Defence Review (SDR):

> Our conclusion is that the ability to deploy offensive air power will be central to future force projection operations. But we cannot be certain that we will always have access to suitable air bases. Even when we do, experience has shown that

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[46] Interview with Rear Admiral Tom Cunningham CBE, (then) Rear Admiral Fleet Air Arm, Portsmouth, 1 July 2011.
[47] Navy Command Carrier Strike Briefing Presentation, May 2012.
[48] For explanation of the attributes of maritime power, see Ministry of Defence, *British Maritime Doctrine* (Joint Doctrine Publication 0-10, 2011), pp.2-1 to 2-6.
[49] Royal Air Force, AP 3000 *British Air and Space Power Doctrine* (Fourth Edition) (Ministry of Defence: 2009), p.7. AP 3000 constituted the Royal Air Force's principal doctrinal document. The above statement is however applicable to maritime airpower; the concept of 'control of the air' for example, being a component of the maritime concept of 'sea control' (see MoD, *British Maritime Doctrine*, pp.2-10 to 2-11).
[50] MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, 2013), see especially the section on 'Air-Sea Integration', pp.4-6 to 4-9.

> bases may not always be available in the early stages of a crisis, and that their infrastructure is not always able to support the full range of operations required. In these and a range of other operational circumstances, aircraft carriers can provide valuable flexibility. They can also offer a coercive presence which may forestall the need for warfighting...[51]

The rationale was reiterated in the 2010 SDSR:

> This capability [Carrier Strike] will give the UK long term political flexibility to act without depending, at times of regional tension, on agreement from other countries to use of their bases for any mission we want to undertake ... In particular, it provides options for a coercive response to crises, as a complement or alternative to ground engagements. It contributes to an overall Force Structure geared towards helping deter or contain threats from relatively well-equipped regional powers, as well as dealing with insurgencies and non-state actors in failing states.[52]

Maritime airpower grants flexibility and a sovereign base from which to operate;[53] it is independent of host nation support or caveats and does not impinge on a local population. Moreover, a carrier can be redeployed immediately after an operation, in contrast to the many months involved in recovering national personnel and assets from far-flung land-based corners of the globe. The aircraft carrier also has the advantage of being combat-ready at the time of arrival. Although aircraft can nominally arrive at a destination faster than a ship, albeit depending on whether over-flight permissions, in-flight refuelling support, intermediate and terminal basing are available, land-based combat aircraft also require their logistic support to deploy in order to undertake operations. The latter point is highlighted with reference to the deployment of Typhoon aircraft in support of Operation *Ellamy* (the UK contribution to operations against Libya in 2011), and cited by Peter Luff, then Minister for Defence Equipment, Support and Technology:

> The Typhoon Force was warned of a possible deployment on 17 Mar 11; by 1300Z on 20 Mar 11, 10 aircraft were in transit to southern Italy ... the rapid provision of support infrastructure and turnaround of the deployed aircraft in theatre allowed RAF Typhoons to be employed in support of UN resolution 1973 by 1200Z the following day, *less than 18 hours after their arrival*.[54]

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[51] Ministry of Defence, *The Strategic Defence Review*, Cm 3999 (London: The Stationery Office, 1998), pp. 143-144.
[52] HM Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (SDSR), Cm 7948 (London: The Stationery Office, October 2010), p.22.
[53] Interview with US Navy officer, London, 28 September 2011. The officer, interviewed under the condition of anonymity, was well placed to offer insight on both British carrier policy and the US experience of naval aviation.
[54] 'Typhoon Force on Operation Ellamy – Narrative' cited in 'Letter from Peter Luff MP, Minister for Defence Equipment, Support and Technology' (Ev. 59) in House of Commons Defence Committee, *Operations in Libya*, Ninth Report of Session 2010-12, Vol. 1, HC 950 (London: The Stationery Office, 2012), p.131. Emphasis added.

The 18-hour lag between the arrival of the Typhoons at their deployed operating base and employment is in distinct contrast to the immediate capability offered by carrier-based aircraft; such a long gap could have serious consequences in some scenarios. The carrier air group deploys with its logistic support and munitions on-board ship and additional logistics support embarked on accompanying auxiliary vessels. This contributes to the carrier's utility as a means of providing influence; the capability to generate combat power at short notice constitutes an overt means of conveying intent whether to coerce an adversary or reassure an ally.

The ability of maritime forces to provide an early intervention capability, thereby potentially enabling a crisis or conflict situation to be contained, is of significant strategic utility and thus provides policy-makers with choice.[55] As a situation develops, it may be deemed necessary to make the carrier task group's presence known in the region; alternatively, the force could withdraw without either side having to appear to climb down or lose face diplomatically should circumstances change; or if necessary, conduct a show of force (as Buccaneers from HMS *Ark Royal* did in 1972 to counter a Guatemalan threat to then British Honduras, now Belize).[56] That is, the strategic utility of an aircraft carrier is its ability to provide choice and a flexible, scalable response to dynamic situations; if combined with a forward presence, this may deter conflict from breaking out (the British response to an Iraqi threat to Kuwait in 1961 is a valuable example of this in action).[57]

An additional strategic and operational benefit provided by aircraft carriers is their reduced *relative* vulnerability to attack, especially compared to land bases. The latter's vulnerability was demonstrated vividly by the Taliban attack on the airfield at Camp Bastion on 14 September 2012. This marked the 'greatest loss of US combat aircraft in a single day since the Vietnam War',[58] destroying six AV-

[55] For further discussion and a historical survey of the utility of aircraft carriers in British service, see Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships: 1945-2010'.
[56] For an account of this operation, see Rowland White, *Phoenix Squadron* (London: Corgi Books, 2010).
[57] See Ian Speller, 'Limited War and Crisis Management: Naval Aviation in Action from the Korean War to the Falklands Conflict', in Benbow (ed.), *British Naval Aviation*, pp.151-175; and Ian Speller, 'Kuwait (Op VANTAGE, July 1961)' in Lt Cdr Tristan Lovering, Royal Navy (ed.), *Amphibious Assault: Manoeuvre from the Sea* (Royal Navy, 2006), pp.413-426.
[58] Peter Felstead, 'Bastion Attack Leaves ISAF Rethinking Security', *Jane's Defence Weekly*, Vol.49, No.39 (26 September 2012), p.4.

8B Harriers on the ground and significantly damaging two more – approximately six per cent of the US Marine Corp's AV-8B fleet.[59] Further, as Benbow states:

> It is often overlooked by the critics of carriers that they are considerably less vulnerable to many forms of attack than air bases, the location of which is easily available on Google Earth. It is a matter of fact that no carrier has been hit by an enemy, let alone sunk, since the end of the Second World War; nor has any aircraft been destroyed by enemy action while onboard a carrier during this period, in contrast to the thousands destroyed on bases ashore.[60]

Moreover, an aircraft carrier does not operate in isolation; it constitutes one component of a task group including escorts, support vessels and submarines. The carrier and its air group, combined with the capabilities (in particular, ASW, anti-surface warfare and anti-air warfare) of the accompanying surface combatants and associated submarine(s) form a mutually supporting force projection and protection system, which combined with the inherently dynamic and complex nature of the maritime environment, significantly complicate an adversary's ability to find, fix and strike the carrier.

The vulnerability of aircraft carriers and their task groups, especially vis-à-vis emergent anti-access/area denial (A2/AD) threats,[61] has to be placed within the wider context of an adversary attaining a find, fix and strike capability rather than a simplistic analysis based on a perceived vulnerability to a specific 'carrier killer'-type weapon system (for example, the Chinese DF-21D anti-ship ballistic missile).[62] The Chinese are investing significantly in the development of the requisite intelligence, surveillance, target acquisition and reconnaissance systems to aid in the locating and prosecution of maritime targets;[63] such investment would be beyond the capabilities of most potential likely adversaries. Further, in the event of a major war involving China, fixed infrastructure – especially airbases and logistic nodes – would be high-value targets for attack.[64] An aircraft carrier

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[59] Ibid.
[60] Tim Benbow and James Bosbotinis, 'The Interoperability of Future UK Air Power, Afloat and Ashore: A Historical Analysis', *Corbett Paper* No.13 (The Corbett Centre for Maritime Policy Studies, January 2014), p.7.
[61] For an overview of the evolving A2/AD threat from a US perspective, see Andrew F. Krepinevich, *Why AirSea* [sic]*Battle?* (Center for Strategic and Budgetary Assessments, 2010).
[62] For analysis of the DF-21 ASBM, see Andrew S. Erickson and David D. Yang, 'Using the Land to Control the Sea? Chinese Analysts Consider the Antiship [sic] Ballistic Missile', *Naval War College Review*, Vol.62, No.4 (Autumn 2009), pp.53-86.
[63] For example, see Krepinevich, *Why AirSea* [sic]*Battle?* p.20.
[64] Jan Van Tol, with Mark Gunzinger, Andrew Krepinevich, and Jim Thomas, *AirSea Battle: A Point of Departure Operational Concept* (CSBA, 2010), particularly pp.18-22.

has to be located before it can be attacked, and to then deploy 'sufficient capable forces to bear to pose a credible threat is an operation that only a handful of nations are capable of achieving'.[65]

It would however be wrong to suggest that carriers are not vulnerable to attack. As Benbow points out, carriers are potentially vulnerable to certain threats such as naval mines or torpedoes that by their nature do not pose a threat to a land base.[66] Further, the shift in emphasis from blue water operations to those in the littoral poses certain challenges to carrier operations, namely a reduction in manoeuvre space (thus potentially making the find, fix and strike task less difficult) and increasing vulnerability to specialist littoral warfare systems, especially advanced diesel-electric submarines.[67] Conversely, the confines and specific geographical characteristics of a littoral environment could be exploited to enhance the defensive capabilities of the carrier task group. This was a key aspect of NATO's Forward Maritime Strategy in the 1980s, governing operations in defence of Norway and NATO's northern flank, whereby NATO carrier battle groups would utilise the Norwegian fjords as defensive bastions.[68] The use of dispersed operations and emission control also further complicate an adversary's attempts to successfully target an aircraft carrier.[69] In the medium term, at least for those carriers designed for catapult-assisted take-off but arrested recovery (CATOBAR) operations (that is, those of the US and French navies), the incorporation of advanced long-range, persistent unmanned combat air vehicles (UCAVs) such as the X-47B[70] and unmanned carrier launched airborne surveillance and strike system (UCLASS)[71] offer the potential to engage an adversary from

[65] Commander David James, Royal Navy, 'Naval Doctrine and the Future Equipment Programme' in Peter Hore and Thomas J. Hirschfield (eds.) *Maritime Aviation: Light and Medium Aircraft Carriers into the Twenty First Century* (Hull: The University of Hull Press, 1999), pp.99-116, quotation, p.110.
[66] Benbow and Bosbotinis, 'The Interoperability of Future UK Air Power', p.5.
[67] For example, the Russian Project 636 *Varshavyanka*-class and *Amur* type submarines. *Russia's Naval Ships, Armament and Equipment* (Moscow: Military Parade, 2009), pp.24-29.
[68] For analysis of the Forward Maritime Strategy and its testing in Exercise Team Work '88, see Eric Grove, *Battle for the Fiørds: NATO's Forward Maritime Strategy in Action* (London: Ian Allan, 1991).
[69] For example, see Robert G. Angevine, 'Hiding In Plain Sight: The US Navy and Dispersed Operations under EMCON, 1956-1972', *Naval War College Review*, Vol.64, No.2 (Spring 2011), pp.79-95.
[70] Northrop Grumman, 'X-47B UCAS', http://www.northropgrumman.com/Capabilities/X47BUCAS/Pages/default.aspx. Accessed 24 September 2013.
[71] US Navy, *Naval Aviation Vision*, January 2012, pp.33-34

intercontinental stand-off positions, thus considerably easing force protection and reducing vulnerability to enemy action.[72]

The development of advanced UCAVs may, as alluded to above, enable suitably configured aircraft carriers[73] to undertake new roles such as the provision of strategic intelligence, surveillance and reconnaissance (ISR) and or strike capabilities.[74] This would further enhance the already significant multi-role capabilities that aircraft carriers provide. It is also important to highlight that the utility of an aircraft carrier should be defined in broader terms than simply what its fast jet component can achieve. The latter do indeed constitute the core element of the ship's weapon system, but the wider utility of the ship, for example, in demonstrating presence and providing a flexible and adaptable mobile base, should not be overlooked. The view, as expressed by then Commander-in-Chief Royal Air Force Strike Command, Air Chief Marshal Sir Brian Burridge, highlights this: '...Carrier Air with its ability to poise in a diplomatically neutral or even coercive way makes a major contribution...Notice that I talk of carrier air not carriers themselves. For it is the aircraft that achieves the effect.'[75] This statement overlooks the fact that it is the ship that delivers presence (as discussed above on pages 107 and 109). Moreover, the embarked aircraft are dependent on the carrier for mission support, operational capability (through support functions such as mission planning, arming and fuelling and maintenance) and command and control. In this context, the combat aircraft are essentially the 'tip of the spear'. It is also critical for the purposes of generating credible and effective carrier airpower that the importance of the ship-air interface is recognised and that the carrier is not seen as 'just a deployed operating base' onto which aircraft can stage.

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[72] For example, see Thomas P. Erhard and Robert O. Work, *Range, Persistence, Stealth and Networking: The Case for a Carrier-Based Unmanned Combat Air System* (Washington DC: Center for Strategic and Budgetary Assessments, 2008), in particular pp.211-225.

[73] At present, prospective UCAV systems will require a CATOBAR-configured carrier to operate from. Navy Command Carrier Strike Briefing Presentation, May 2012.

[74] For example, see Erhard and Work, *Range, Persistence, Stealth and Networking*, pp.222-225. The example cited, it must be noted is from a US perspective and placed in the context of a confrontation with China, but it remains relevant as an illustration of what utility a potential UCAV system could provide in capability terms.

[75] Air Chief Marshal Sir Brian Burridge, 'The Trenchard Memorial Lecture', *Air Power Review*, Vol.8, No.1, (Spring 2005), pp.1-9, quotation, p.8.

The roles an aircraft carrier is capable of undertaking will to a significant extent, be dependent on the size and configuration of the carrier itself. A larger vessel (one capable of embarking an air group of 40 or more fixed and rotary wing aircraft, and typically exceeding 40,000 tons displacement)[76] will be capable of embarking a larger and potentially more diverse air group,[77] achieving a higher sortie generation rate,[78] have a larger and more flexible hangar deck and a larger flight deck, thus enhancing the efficiency of aviation operations.[79] A larger flight deck, for example, enables a greater number of aircraft to be maintained on deck alert, thereby enhancing the sortie generation rate, and may ease mixed fixed and rotary-wing operations by enabling separate operating areas on deck.[80] Further, a larger vessel is more cost-effective due to its higher internal volume, less constrained space for fitting out and has greater through-life growth potential.[81] This is not to say that small carriers such as the *Invincible*-class and the new Spanish *Juan Carlos*-class[82] or Italian *Cavour*-class[83] do not provide a valuable capability, but rather that larger designs (such as the *Queen Elizabeth*-class or US *Nimitz* or *Gerald R. Ford*-class carriers) offer advantages, in particular, as stated by then Commander David James, Royal Navy: 'A criticism of our current and

[76] The French Navy's nuclear-powered aircraft carrier, *Charles De Gaulle*, is an example of such a vessel. 'Charles De Gaulle Nuclear-Powered Aircraft Carrier', http://www.naval-technology.com/projects/gaulle/. Accessed 25 September 2013.

[77] This is highlighted by the composition of an American carrier air group, which in addition to a sizeable contingent of fighter/attack aircraft, AEW aircraft and ASW helicopters, also includes electronic warfare aircraft, and until recently, specialist assets such as the S-3B Viking ASW/anti-surface warfare aircraft, electronic intelligence aircraft and dedicated air-to-air refuelling aircraft. For discussion of the evolving composition of an American carrier air group, see Benjamin S. Lambeth, *American Carrier Air Power at the Dawn of a New Century* (RAND Corporation, 2005), pp.89-94.

[78] For discussion of the importance of carrier size and sortie generation rate, see Commander D. R. James, Royal Navy, 'Carrier 2000: A Consideration of Naval Aviation in the Millennium – II', *The Naval Review*, Vol.87, No.2, (April 1999), pp.105-113.

[79] Commander David Hobbs, Royal Navy (retd.) describes the narrow flight deck of the *Invincible*-class its 'greatest single weakness' and states 'The narrow deck and long, inboard island combined to make cross-deck landing extremely difficult and, therefore, reduced the tactical flexibility that a well-designed ship would have enjoyed'. Hobbs, *A Century of Carrier Aviation*, p.264 and 266.

[80] James, 'Carrier 2000', p.107.

[81] Ibid., p.112.

[82] 'Juan Carlos I Landing Helicopter Dock, Spain', http://www.naval-technology.com/projects/juan-carlos/. Accessed 10 September 2013. Although designated a landing helicopter dock (LHD), and thus perhaps more accurately referred to as an amphibious assault vessel, the ship is intended to operate as an aircraft carrier and provide multi-role capabilities.

[83] 'Cavour Aircraft Carrier', http://www.naval-technology.com/projects/num/. Accessed 10 September 2013.

indeed any small carrier is that they carry insufficient aircraft to be militarily decisive'.[84]

The British government's 2010 SDSR called into question the utility of a large air group by stating with regard to the *Queen Elizabeth*-class:

> We cannot now foresee circumstances in which the UK would require the scale of strike capability previously planned [36 embarked fast jets]. We are unlikely to face adversaries in large-scale air combat. We are far more likely to engage in precision operations, which may need to overcome sophisticated air defence capabilities. The single carrier will therefore routinely have 12 fast jets embarked for operations while retaining the capacity to deploy up to the 36 previously planned...[85]

This decision has significant strategic and operational implications. In strategic terms, the small size of the intended fast jet component of the air group (and the commitment to only operating one ship - the second being kept at extended readiness)[86] may restrict the deterrent value of Britain's carrier capability.[87] In order to be a deterrent, capability must be demonstrated – thus conveying credibility, which provides influence.[88] In addition, in the context of planning for coalition operations, the limited air group may be perceived to constitute tokenism especially viewed alongside the French aircraft carrier *Charles De Gaulle* and its air group of up to 40 Rafale, Super Etendard and E-2C Hawkeye and helicopters. It warrants mention that the air group embarked for operations against Libya in 2011 comprised eight Rafale, six Super Etendard, two E-2C Hawkeye and ten helicopters (26 aircraft in total).[89] The perceived credibility of the Russian Navy's carrier capability is also relevant in this regard. Russia operates one aircraft carrier, the 58,600 ton *Admiral Kuznetsov*, and although designed to embark an air

[84] James, 'British Naval Doctrine and the Future Equipment Programme', p.109.
[85] HM Government, *SDSR*, p.23.
[86] See ibid., p.20 for definition of 'extended readiness'.
[87] The Secretary of State for Defence has implied that both carriers will, following the decision to pursue a STOVL solution, enter service. However, it remains that 'a final decision on the use of the second carrier will be taken as part of SDSR 2015'. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27397/oral_statement_on_carrier_strike_capability.pdf. Accessed 10 September 2013.
[88] Interview with US Navy officer.
[89] 'Libya: aircraft carrier Charles de Gaulle gets underway', 21 March 2011, French Ministry of Defence, http://www.defense.gouv.fr/english/content/view/full/111961. Accessed 10 September 2013.

group of up to 36 Sukhoi Su-33 Flankers,[90] only deploys (infrequently) with 12 Flankers embarked;[91] the ship does not convey an effective presence.[92]

The argument that 'We cannot now foresee circumstances in which the UK would require the scale of strike capability previously planned' contains three elements of risk. Firstly, the scaling down of the air group from 36 to 12 combat aircraft (thus deploying fewer combat aircraft than the *Invincible*-class did at their peak) suggests that the UK would not wish to contribute any more than a minimal force to an operation.[93] In this regard, 32 fast jets are seen as typically required to provide indigenous protection for a brigade (the level of effort focused on in the SDSR).[94] Secondly, it suggests a preference for land-basing of combat airpower for expeditionary operations, which may be problematic in terms of political and diplomatic constraints, and militarily via potential opposing A2/AD strategies. Thirdly, as Christine H. Fox discusses with regard to the value of small aircraft carriers,[95] in the near future, the expected focus on irregular warfare, the provision of support to small ground units and ensuring battlespace dominance against asymmetric threats, requires 'aircraft airborne on-station continuously for extended periods of time... [and] requires either high sortie rates or "chain-gang" of aircraft for persistence at long ranges...Small carriers lack sufficient numbers and types of aircraft to perform these missions...'[96] That is, the prospective operating environment and experience from recent operations, such as Libya,

[90] 'Russian paper ponders composition of fleet on naval exercises in Atlantic', *BBC Monitoring* (via LexisNexis), 24 January 2008.
[91] 'Project 1143.5 heavy aircraft-carrying cruiser Admiral Kuznetsov', *Russia's Naval Ships, Armament and Equipment*, pp..32-33.
[92] Jon Rosamond, 'Carrier group wargames [sic] hint at Russia's determination to return to world stage', *Jane's Navy International*, Vol.113, No.2 (March 2008), pp.12-13.
[93] The respective peak fast jet components of the British and French contributions to operations against Libya is 2011 is noteworthy at 22 and 44 respectively. IISS, *The Military Balance 2012* (London: Routledge for The International Institute for Strategic Studies, 2012), p.14.
[94] Air Vice-Marshal Baz North [then Assistant Chief of the Air Staff] in Elizabeth Quintana, 'Austere Air Power? British Air And Space Power In The Post-SDSR Environment', RUSI Workshop Report, 2010, p.1. For SDSR planning assumptions, see HM Government, *SDSR*, p.19, para 2.15.
[95] Christine Fox is currently Director, Cost Assessment and Program Evaluation at the US Department of Defense, she was previously president of the Center for Naval Analyses. 'Christine H. Fox, Director, Cost Assessment and Program Evaluation', http://www.defense.gov/bios/biographydetail.aspx?biographyid=276. Accessed 10 September 2013.
[96] Christine H. Fox, 'Carrier Operations: Looking Toward the Future – Learning from the Past', Center for Naval Analyses (D0020669.A1/Final, 27 May 2009), p.24.

indicates a continuing requirement for a carrier air group to possess sufficient mass to in Commander James' words, 'be militarily decisive'.

The British government's decision to reduce the size of the planned air group of the new carrier(s) is also indicative of the professed lack of knowledge highlighted by Benbow (see page 98). The SDSR states that 12 fast jets will be routinely embarked on the active carrier but that the capability to deploy up to 36 aircraft will be retained. As will be discussed subsequently, the capability to operate from an aircraft carrier requires sustained investment in embarked training in order to develop and maintain competence in aviation operations at sea. Policy-makers could not expect in a crisis to order an extra 24 aircraft out to the carrier and assume that those aircraft could be employed effectively in short order unless their pilots – and the support personnel on the ship – are well-versed in carrier operations and this is only achieved through regular and sustained embarkation.

The importance of a proficient ship-air interface also underpins a carrier's contribution to coalition operations. Whether operating in a US-led coalition or as the lead nation, perhaps alongside France or a major Commonwealth ally such as India or Australia,[97] a British aircraft carrier, in particular one as capable as the *Queen Elizabeth*-class constitutes a significant contribution. As discussed above, carriers can reassure regional allies and partners, and through exercising a forward presence, can undertake joint training, thus facilitating familiarity and potentially interoperability, thereby laying the foundations for coalition operations. This is also relevant to developing enhanced cooperation between established allies; in the realm of carrier operations, Britain and the US, for example, have a close relationship regarding the development of interoperability between the US Navy and Marine Corps and the Royal Navy: this was demonstrated vividly in 2007 in the joint exercise *Bold Step*, which saw 15 US Marine Corps Harriers operate for two and a half weeks from HMS *Illustrious*.[98] In addition, few states possess a carrier-based airpower capability, and aside from the US, only the UK will possess a sea-based fifth generation aircraft; this will provide a highly valuable

[97] As will be discussed in chapter six (see pages 218-219), the Far East constitutes a strategically significant region for the UK, and in that respect, it may be necessary for the UK to operate alongside local allies.
[98] For further discussion of Exercise *Bold Step*, see Benbow and Bosbotinis, 'The Interoperability of Future UK Air Power', p.26.

capability (especially accounting for the ISTAR, command and control and electronic attack capabilities of the aircraft[99]) and niche contribution to most potential coalitions.

The investment required to develop an aircraft carrier capability is significant but non-discretionary if the capability is to be effective and credible both for national and coalition purposes. Moreover, the ability to utilise a carrier for non-traditional roles, for example, as a base for Special Forces[100] or suitable land-based aircraft,[101] is contingent on the existence of a proficient ship-air interface. This was the case in the Falklands War, where RAF Harrier GR3 ground-attack aircraft were deployed to the carrier HMS *Hermes* to augment the ship's own Sea Harrier fighters:

> RAF aircraft flying on to *Hermes* joined a well-founded airfield that was experienced in the safe operation of Harriers in poor weather and with a fully worked up Air department optimised for the environment. They were supported and trained by the existing carrier system. They also had the benefit of dovetailing with the RN's 800 Sqn, who provided deck briefings and an intensive work-up package. Their minds were firmly focussed upon the dangers of operating from a ship.[102]

The naval interface is required in order to provide 'the professional and physical basis for effective operations in an unfamiliar environment'.[103] This is illustrated by US Army experience in Operation *Uphold Democracy*, where the aircraft carrier USS *Eisenhower* was employed as a helicopter carrier:

> Helicopter separation was an important lesson learned from the operation. As helicopters leave the flight deck, they lose ground effect. If one helicopter follows too closely behind the previous one, it can fly into the downward wash from the first helo. Both of these effects can cause altitude loss. Army helicopter pilots, accustomed to flying over land, held to tight formations when arriving or departing

[99] ISTAR refers to intelligence, surveillance, target acquisition and reconnaissance.
[100] For example, HMS *Illustrious* was used in this role as part of the response to the 11 September 2001 terrorist attacks, Childs, *The Age of Invincible,* p.152. The USS *America* also hosted a Joint Special Operations Task Force for the 1994 US intervention in Haiti, Operation *Uphold Democracy* (the USS *Dwight D. Eisenhower* operated as a helicopter carrier in this operation, embarking US Army helicopters), E. D. McGrady and Robert E. Sullivan, 'Operation Uphold Democracy: Observations on Joint Assault Forces Operated From a CV', Center for Naval Analyses (CRM 96-3/July 1996).
[101] For discussion of this from a principally British perspective, see Benbow and Bosbotinis, 'The Interoperability of Future UK Air Power'. For a US perspective, and broader discussion of non-traditional missions for carriers, see John Gordon IV, et. al., 'Leveraging America's Aircraft Carrier Capabilities: Exploring New Combat and Noncombat Roles and Missions for the U.S. Carrier Fleet' (RAND Corporation, 2006).
[102] DCDC, 'Joint Operations – lessons from the Falklands Campaign', 20 January 2009, p.3.
[103] Ibid., p.6.

> the flight deck. Standard safe helicopter separations need to be established, and Army units operating from flight decks must train to the standards.[104]

This case is particularly relevant to thinking regarding the employment of Britain's forthcoming *Queen Elizabeth*-class carriers. This is because they are intended to provide a 'Carrier Enabled Power Projection' (CEPP) capability; a hybridised carrier strike and littoral manoeuvre capability.[105] This will include operating a mixed air group from the operational aircraft carrier including concurrently up to 12 Merlin, a small number of Chinook and up to eight Apache helicopters alongside 12 F-35s. In this regard, McGrady and Sullivan observed that for Operation *Uphold Democracy*:

> No fixed-wing aircraft were embarked, which allowed the deck to be operated completely as a helo deck. Attempting to operate even a few fixed-wing aircraft from the CV would have complicated matters immensely because it would have been necessary to build deck operations around fixed-wing launch-and-recovery operations. Even operating fixed-wing aircraft during periods of no helo operations would have been a major problem because a major reorganization of the flight deck and hangar decks would have been required to clear the necessary areas.[106]

This highlights the point emphasised by Benbow (see page 99) regarding the need to have an understanding of what aircraft carriers can do and what options they provide policy-makers. As will be discussed below, CEPP is an unprecedented approach to carrier operations and 'no other country uses its carriers in the way that the United Kingdom is planning to do';[107] the question thus should be posed – does the pursuit of CEPP indicate an insufficient degree of understanding amongst policy-makers regarding the utility of aircraft carriers and therefore how they should be employed? In order to answer this question, the process that resulted in the development of CEPP requires examination – that is, the evolution of British thinking concerning a replacement for the *Invincible*-class aircraft carriers.

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[104] McGrady and Sullivan, 'Operation Uphold Democracy: Observations on Joint Assault Forces Operated from a CV', p.13.
[105] MoD(UK)/DCDC, *British Maritime Doctrine*, p.3-19.
[106] McGrady and Sullivan, 'Operation Uphold Democracy: Observations on Joint Assault Forces Operated from a CV', p.43.
[107] National Audit Office, *Carrier Strike*, Session 2010-2012, HC 1092 (London: The Stationery Office, 2011), p.32, para 3.6.

From CVSG(R) to CVF: the Evolving Rationale for the *Queen Elizabeth*-Class

The purpose of this part of the chapter is to provide an overview of the evolving rationale underpinning the British government's policy toward a replacement aircraft carrier capability. Analysis of the specific options that have been developed, considered or potential alternative courses of action will be undertaken in the following chapter. The following analysis principally covers the period from 1998 to the present, that is, from the decision taken in the SDR to 'buy two new larger aircraft carriers to project power more flexibly around the world'.[108] It is however necessary as a means of establishing context, to firstly provide an outline of pre-SDR thinking regarding a replacement aircraft carrier capability; this will particularly highlight the influence of the wider shift in British maritime thinking in the mid-to-late 1990s.

The Ministry of Defence commenced conceptual studies into a replacement for the *Invincible*-class in 1994, which was intended to lead to the generation of a Staff Target and Ministerial approval for a replacement carrier programme by the end of 1997.[109] The change of government following the May 1997 General Election and subsequent Strategic Defence Review resulted in the Staff Target for The Future Aircraft Carrier being delayed until after the SDR was completed in the summer of 1998.[110] The initial studies underway in the period 1994-96 were under the title of CVSG(R), that is, a 'replacement guided missile-armed anti-submarine support aircraft carrier' – the *Invincible*-class at this stage had the CVSG designation. The CVF programme itself was conceived in 1996.[111]

The change in designation from CVSG(R) to CV(F) is indicative of the wider shift underway in British maritime thinking in the second half of the 1990s. This is because it marks the move away from the late Cold War (particularly 1970s and 1980s) focus on sea control in the eastern North Atlantic to a broader expeditionary perspective. The *Invincible*-class also reflected this shift. The CVSG designation highlighted the hybrid nature of the class in that the 'G' aspect

[108] MoD, *SDR*, p.5.
[109] Commander D. R. James, Royal Navy, 'Carrier 2000: A Consideration of Naval Aviation in the Millennium – I', *The Naval Review*, Vol.87, No.1 (January 1999), pp.38.
[110] Ibid.
[111] Interview with retired senior MoD official, London, 10 June 2014.

of the designation referred to the organic area air defence capability provided by the Sea Dart surface-to-air missile system and the cruiser origins of the class. The Sea Dart system was removed from the *Invincible*-class during the 1990s in order to enhance the aviation capabilities of the ships (by enabling a flight deck extension and allowing the space previously occupied by the Sea Dart magazine to be used for aircraft ordnance)[112], including facilitating the embarking of RAF Harrier GR7s. The latter reflected a change in role for the *Invincible*-class:

> The Invincible Class carriers were designed for Cold War anti-submarine warfare operations with helicopters and a limited air defence capability provided by a small number of embarked Sea Harriers. This is no longer the main requirement. The emphasis is now on increased offensive air power, and an ability to operate the largest possible range of aircraft in the widest possible range of roles.[113]

The removal of the Sea Dart system and change in role from ASW-focused sea control to maritime power projection was highlighted by the change in designation for the *Invincible*-class from CVSG to CVS, although the latter designation, under the US system on which it is based, would classify the *Invincible*-class as anti-submarine support carriers. This would not be the first time there has been a confused application of the US designation system. As Grove states with regard to the initial designation of the *Invincible*-class:

> By now the TDCC had acquired a new designation – CAH, or "helicopter carrying heavy cruiser" in the American system the MOD(N) now used. Unfortunately, the Royal Navy's grasp of the meanings of these abbreviations has never been entirely firm, and soon the accepted meaning seems to have been "cruiser (even sometimes "carrier") assault helicopter," a strange title as, at this stage, the ship had no assault role...[114]

The new emphasis on power projection also formed the basis for thinking regarding the replacement carrier capability:

> The focus for our maritime forces in the new environment will move towards rapid deployment operations...Aircraft carriers will have a wide utility, including for deterrence and coercion. Our current INVINCIBLE class carriers will be given a wider power projection role by the development of a "Joint Force 2000" combining RN and RAF Harrier aircraft. To meet our longer term needs, we plan to replace our current carriers from around 2012 by two larger, more versatile, carriers capable of carrying a more powerful force, including a future carrier borne aircraft to replace the Harrier.[115]

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[112] Childs, *The Age of Invincible*, p.149.
[113] MoD, *SDR*, p.144.
[114] Grove, *Vanguard to Trident*, p.320.
[115] MoD, *SDR*, p.39.

The focus on the maritime power projection role for CVF reflected both the evolving maritime doctrinal context and strategic environment of the mid-to-late 1990s. The former is illustrated by the development of the Maritime Contribution to Joint Operations and the manoeuvrist approach;[116] the latter by operations in the Balkans and vis-à-vis Iraq.[117] It is also apparent in the thinking underpinning the development of the Future Carrier Borne Aircraft (FCBA) requirement. The FCBA, the planned replacement for the Sea Harrier FA2, was defined in an outline requirement endorsed in 1996 as: 'An all-weather, survivable, multi-role fighter with the ability to perform air defence, offensive air support and deep interdiction missions over a 500nm radius of action'.[118] This is in contrast to the Sea Harrier FA2 which was principally intended to serve in the air defence role with a secondary anti-ship and reconnaissance capability.[119]

Before discussing further the strategic rationale for CVF, it is necessary to set out the policy context within which the SDR decision on the carriers was made. As mentioned above, initial work on developing a replacement for the *Invincible*-class commenced in the mid-1990s, and initial naval thinking on a replacement carrier envisaged a STOVL design of similar capability to the *Invincible*-class embarking the relevant variant of the US Joint Strike Fighter (JSF).[120] The UK had joined the then Joint Advanced Strike Technology (JAST) programme in December 1995; this became the JSF programme in 1996, following a '"firming up" of operational requirements across the three US armed services'.[121] The JAST/JSF programme succeeded a number of US and joint US-UK programmes, the latter in particular covering advanced STOVL (ASTOVL) projects with the US Marines Corps with a view to developing a supersonic STOVL replacement

[116] See in particular, BR1806 *British Maritime Doctrine*, Second Edition (London: The Stationery Office, 1999), chapter nine, 'Summarising the Maritime Contribution to Joint Operations', pp.159-171.
[117] For example, see John Roberts, *Safeguarding the Nation: The Story of the Modern Royal Navy* (Barnsley: Seaforth Publishing, 2009), pp.225-229 and pp.244-247.
[118] Richard Scott, 'Future Carrier-Borne Aircraft', *Jane's Defence Weekly*, Vol.38, No.10 (9 September 1998), pp.64-68.
[119] Interview with Commander Henry Mitchell, Royal Navy, Shrivenham, 20 September 2011. Commander Mitchell is a Fleet Air Arm officer and has previously commanded 801 Naval Air Squadron, served as the final Commander Sea Harrier Force, held the position of Commander (Air) on HMS *Illustrious* and from 2001-04, was a desk officer for the Joint Combat Aircraft programme .
[120] Interview with Rear Admiral Cunningham.
[121] Scott, 'Future Carrier-Borne Aircraft'.

for the Harrier/Sea Harrier, AV-8B and F/A-18.[122] The election of the new Labour government in 1997 brought with it a new appetite for aircraft carriers, and this, along with the overall political-military environment (for example, the aforementioned operations in the Balkans and Middle East, and general internationalism of the new government) served as a significant driver for the carrier decision in the SDR.[123] Further, the Ministry of Defence (MoD) equipment programme itself served as a second driver for the carrier decision.[124] This was because, in addition to the carrier replacement, programmes to develop successors to the RAF's Tornado and Harrier aircraft were being developed.[125] That is, a substantial part of the UK's airpower requirements for the mid-to-long term were simultaneously under consideration and were therefore to a significant extent, inter-linked. This was especially the case with regard to the Tornado replacement, then referred to as the Future Offensive Aircraft (the project would subsequently become the Future Offensive Air System – FOAS). This programme was a key element of MoD planning from the mid-1990s until 2005; for example, in 1996, the periodical *Flight International* reported:

> A top-level study is being carried out within the MoD into its future long-range offensive capability, with the FOA an "integral part of the equation". Other elements of the yet-to-be-balanced equation include the Royal Navy's future aircraft carrier and conventional cruise-missile-armed submarines.[126]

Prior to the SDR, the FCBA was intended to replace the Sea Harrier; for this purpose, approximately 60 aircraft were required.[127] However, following the decision in the SDR to establish a joint Royal Navy-Royal Air Force Harrier force, Joint Force 2000, the separate FCBA and Royal Air Force Harrier replacement requirements were merged, thus creating a requirement for 120 aircraft under what would become the Joint Combat Aircraft (JCA) programme (it was initially known as the Future Joint Combat Aircraft).[128] A key driver in the creation of Joint Force 2000 was the realisation by the RAF that, in order to

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[122] See ibid. and Bill Sweetman, *Joint Strike Fighter: Boeing X-32 vs Lockheed Martin X-35* (Osceola, Wisconsin: MBI Publishing, 1999) for accounts of pre-JAST STOVL efforts and the evolution of the JAST/JSF programme.
[123] Interview with Rear Admiral Cunningham.
[124] Ibid.
[125] Ibid.
[126] Douglas Barrie, 'Offensive Ambitions', *Flight International* (28 August-3 September 1996), pp.50-52, quotation, p.50.
[127] Interview with Rear Admiral Cunningham.
[128] Ibid.

acquire a fifth generation aircraft, it would have to agree with the Royal Navy on a force that could deploy from land and sea.[129] This was due to, effectively, the UK being capable of only affording one fleet of such aircraft.[130] The creation of Joint Force 2000, and once operational known as Joint Force Harrier,[131] was a key element of the nascent wider future carrier effort as outlined in the SDR:

> The operational potential of a joint carrier air wing was graphically shown earlier this year in the Gulf, when the deployment of Royal Air Force Harrier GR7s alongside the Royal Navy Sea Harriers on HMS INVINCIBLE made an important contribution to the multinational force applying pressure on Iraq to comply with UN resolutions [Operation *Bolton*]. Total integration of current Harrier aircraft into a single force is impracticable. The two Harrier variants share only around 10% of their airframe and avionics, and they have quite different primary operational roles. But closer harmonization between the existing Harrier forces could pave the way towards a truly joint force for the future. Capitalising on the success of current joint Harrier operations, we propose to develop a Joint Force 2000, which could eventually involve the replacement of all Harriers with a common aircraft type. There are several options for the new aircraft (which would be capable of operating from ashore and afloat). For the Joint Force 2000 concept to work successfully, we will need a common aircraft, common operating procedures, common maintenance practice and a common support organisation. Further study will begin shortly to determine the best way to realise the potential which the concept offers to provide a flexible and deployable joint force, able to operate either from land bases or aircraft carriers.[132]

The above quotation highlights another key strand of thought regarding the development of CVF – its role as a 'joint defence asset'. This was described by Commander James as meaning: 'The concept does not rely on a unique set of aircraft specifically earmarked for the CVF but rather on the ship's ability to embark an air group tailored to the specific mission'.[133] During 1997-98, the notion that CVF could be developed as a 'mobile bird farm' was generated. This concept was meant to convey the idea that CVF would have a broader utility, operate the widest range of UK fixed and rotary-wing aircraft and be affordable.[134] However, the concept was flawed as it omitted the mission support requirement, that is, pre-working up of the ship and embarked aircraft is still required in order to ensure integration with the ship and environment.[135] The latter is highlighted by

[129] Interview with Admiral Sir Jonathon Band, London, 23 June 2014.
[130] Interview with retired senior MoD official.
[131] See Flight Lieutenant Will Dole RAF, 'Joint Force 2000 – Making it Happen', *Warship World*, Vol.6, No.10 (Spring 2000), p.8; and Rear Admiral Sir Iain Henderson CBE, 'My Jobs: Joint Force Harrier Commander', *RUSI Journal*, Vol.145 No.3 (June 2001), pp.21-27.
[132] MoD, *SDR*, p.199.
[133] James, 'Naval Doctrine and the Future Equipment Programme', p.103.
[134] Interview with Rear Admiral Cunningham, Portsmouth, 16 May 2012.
[135] Ibid.

experience from the Falklands War. The detachment of Royal Air Force Harrier GR3s deployed to HMS *Hermes* required some modification to enable operations from the carrier and the integration of Fleet Air Arm rocket pods on the aircraft in lieu of the RAF's SNEB pods, which were unsuitable for carrier operations as the pods were not insulated against the high electromagnetic forces aboard a ship.[136] The notion of CVF as a joint defence asset was also intended to convince the Royal Air Force that it 'was their carrier as well',[137] and thus ensure at least tacit acceptance of the new carrier programme.[138]

The SDR explicitly cited the experience of operations in the Persian Gulf, in particular Operation *Bolton*, as demonstrating the rationale for CVF. This received further vindication in December 1998 with the Anglo-US Operation *Desert Fox*, a four-day operation against targets in Iraq following non-compliance with UN Security Council resolutions pertaining to disarmament. The importance of *Desert Fox* to thinking on carrier airpower was that the first phase of the operation only involved sea-based assets (ship and submarine-launched cruise missiles and carrier-based aircraft).[139] Operations in the Gulf provided a reference with which to benchmark the size of air group that CVF would require, and therefore inform the size of the carrier itself. In the context of Operation *Bolton*, then Captain James Burnell-Nugent stated:

> There was a day and a night mission every 24 hours, generally with four [Harrier] GR7s over Iraq in company with four [Sea Harrier] FA2s providing force protection. Although the interim directive from PJHQ [Permanent Joint Headquarters] called for such a mission once per day, *the desire to maximise UK visibility on the ATO* [air tasking order], as well as the degree of training and integration needed, resulted in double that rate of flying.[140]

The implications for CVF were summarised by Rear Admiral Sir Iain Henderson, then Flag Officer Maritime Aviation:

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[136] Burden et al., p.372.
[137] Interview with Vice Admiral Sir Jeremy Blackham, London, 13 February 2012.
[138] The previous attempt to develop a replacement conventional aircraft carrier – CVA-01 – brought to the fore the long-term rivalry between the Royal Air Force and Royal Navy regarding the need for carrier-based airpower. The RAF successfully argued that land-based airpower, under its control, could provide, at lower cost, the capabilities that the Royal Navy argued carriers were needed for.
[139] Interview with Rear Admiral Cunningham, July 2011.
[140] Captain James Burnell-Nugent, Royal Navy, 'HMS *Invincible* and Operation Bolton – A Modern Capability for a Modern Crisis', *RUSI Journal*, Vol.143 No.4 (August 1998), pp.19-26. Emphasis added.

> What one needs to do is to be able to deliver a large package of ordnance ashore, in one go, if need be. The basic building block is a four aircraft formation. So I believe that something in the order of 40 to 50 aeroplanes would be optimal, divided principally between the bomber and fighter role.[141]

In doctrinal terms, between 2001 and 2010, the vision for the future carriers remained consistent. As discussed in the preceding chapter (see pages 93-94), the development of the *Future Navy* and associated *Future Navy Operational Concept* and *Versatile Maritime Force* papers in 2000-2001 provided the intellectual framework within which the carriers would be developed and their roles and utility articulated. The importance of the future carriers to the *Future Navy* vision was articulated in 2004 by the then First Sea Lord, Admiral Sir Alan West:

> To meet the future pace of change the conceptual headmark [sic] for this versatile maritime force will be agility, both in the delivery of capability and in the way the force operates...This is reflected in our future equipment programme, which is focused on delivering effect from the sea onto land. This will include a land attack capability, supporting forces ashore and securing access to the theatre of operations. Central to this is the CVF (Future Aircraft Carrier), which with the joint combat aircraft (JCA) and the maritime airborne surveillance capability, will be the basis of Britain's joint force projection...I see CVF and JCA as the Ministry of Defence's most importance procurement project.[142]

It is important to note that the principal role of CVF was highlighted as being an enabling capability, that is, securing access to the theatre of operations, providing support to forces ashore and providing the foundation for wider joint operations – thus emphasising the broader utility of the MCJO. The 2007 *Future Maritime Operational Concept* (FMOC - successor to the previous *Future Navy Operational Concept*) outlined further the doctrinal position of the new carriers, which had by this stage been placed under the policy umbrella of Carrier Strike.[143] The FMOC comprehensively summarised in broad terms the roles and utility of the forthcoming carriers:

> The CS capability will energise and enhance a wide range of tasks, including those envisaged within the Future Land Operational Concept (FLOC) and Future Air and Space Operational Concept (FA&SOC), and will contribute to operations in most

[141] Rear Admiral Sir Iain Henderson CBE, 'My Jobs: Joint Force Harrier Commander', *RUSI Journal*, Vol.145 No.3 (June 2001), pp.21-27.
[142] Admiral Sir Alan West, 'Maritime Power in a Global Context', *RUSI Journal*, Vol.149, No.3 (June 2004), pp.8-13.
[143] The FMOC refers to a document dating from November 2005, entitled 'Carrier Strike Policy Baseline'; this would appear to be the point at which the term Carrier Strike was established in order to govern policy toward the CVF programme and related programmes such as the JCA, maritime airborne surveillance and control (MASC) system and support assets. MoD/DCDC, *Future Maritime Operational Concept* (2007), p.1-18.

> environments, while sustaining flying operations on a continuous basis or as dictated by the operational situation. A CS TG [Task Group], with a tailored Air Group and supporting MFP [Maritime Force Projection], will enable the delivery of flexible, scaleable [sic] expeditionary offensive air power – and other Combat and Combat Support activity – under the least favourable Access, Basing and Overflight (ABO) conditions from a highly mobile, well-found sovereign operating base. In its primary role, this will provide deep strike against Time Sensitive Targets (TST) in all environments and the ability to support the Land Component in Close Air Support and Air Defence over land and sea. Additionally the CS TG will provide an organic air surveillance and airspace coordination capability with utility across the full spectrum of Military Tasks, as well as offering a Forward Aviation Support (FAS) capacity, a secure operating base for Special Forces (SF) and the ability to operate a wide range of attack and support air assets, including unmanned vehicles.[144]

The FMOC ably articulated the strategic utility of aircraft carriers, yet as Benbow highlighted, senior military officers and policy-makers admitted ignorance of the utility of carrier airpower during the formulation of the SDSR in 2010. It is possible that the professed ignorance of the utility of carrier airpower resulted in part from a policy of deliberate obfuscation on the part of some elements (civilian and military) in the Ministry of Defence. This is illustrated by the use of terminology pertaining to carrier airpower. The term 'carrier airpower' has been in wide use internationally since before the Second World War, however, only the UK has, since 1998, continually sought to redefine the meaning of the term and the roles of aircraft carriers.[145] This is reflective of enduring tensions within the Ministry of Defence (discussed in chapter six) and is highlighted by the shift in 2010 from the term Carrier Strike to Carrier Enabled Power Projection.[146] The latter constitutes the current policy baseline governing the development and eventual operational employment of the *Queen Elizabeth*-class aircraft carriers. It is also the biggest challenge facing the Royal Navy for the next 20 years.[147] CEPP, rather than delivering a clearly defined and understood model of carrier airpower (for example, as in the US or France or as articulated in the FMOC), seeks to deliver a hybrid capability providing elements of Carrier Strike and littoral manoeuvre. It appears to constitute a high-risk approach to what is already an inherently complex and demanding task – the delivery of airpower at and from the sea. CEPP is, as highlighted by the National Audit Office, an unprecedented approach to carrier-based airpower; its commitment to concurrent fixed and rotary

[144] Ibid., pp.1-18 to 1-19.
[145] Interview with Rear Admiral Cunningham, July 2011.
[146] Ibid.
[147] Interview with Commander Mitchell, 20 September 2011.

wing operations adds an additional layer of risk and complexity.[148] The latter aspect will be discussed more fully in chapter five, but it is important to note that such an approach to carrier airpower is unique to the UK.[149] The approach defined by CEPP is achievable, but will require *dedicated* assets (fixed and rotary-wing), joint service support and full political support and direction with a complete awareness of the environmental risks associated with operating from an aircraft carrier.[150] However, as Rear Admiral Chris Parry has written with regard to the future carriers:

> It is important that concepts take into account that these extremely large ships have a range of potential uses beyond that of simply being a launch-and-recovery platform for fixed- and rotary-wing aircraft. It will be essential to maximise the flexibility of use of these capital ships and they should be viewed as multi-purpose and potentially multi-role platforms, capable of conducting a range of simultaneous and discrete missions in addition to – and in the absence of – their carrier-strike capability…. Right at the heart of the concept should be the continuous encouragement of an adaptive capability and modular mentality that offer the facility to vary force, task and support packages to reflect the ever-changing range of effects and activities required, both within the ships themselves and across the full range of associated forces.[151]

However, ultimately, the extent to which this is forthcoming will be contingent on the degree of knowledge and understanding of the strategic utility that carrier airpower provides.

Conclusion

The purpose of the preceding discussion has been threefold. It has sought to highlight the enduring role of carrier airpower in British maritime and national strategy; to examine in broad terms, the strategic utility of carrier airpower, and thus inform the subsequent discussion of the rationale for Britain proceeding with a replacement for the *Invincible*-class. The examination of the rationale for acquiring the *Queen Elizabeth*-class is necessarily in overview form as the following two chapters will expand upon the detail of the debates concerning the design, development and particular roles of the ships and their contribution to wider British strategy. From the preceding analysis, it is discernible that aircraft

[148] For example, see McGrady and Sullivan, 'Operation Uphold Democracy: Observations on Joint Assault Forces Operated from a CV', p.43.
[149] Interview with Rear Admiral Cunningham, May 2012.
[150] Interview with Commander Mitchell, September 2011.
[151] Rear Admiral Chris Parry, 'The United Kingdom's Future Aircraft Carriers: What Are They Good For?' *RUSI Journal*, Vol.157, No.6 (December 2012), pp.4-9, quotation, p.9.

carriers have been an enduring contributor to British defence and strategic objectives for nearly a century. Moreover, in particular with regard to the early development of military aviation, the Royal Navy has played a significant role in the successful exploitation of the air environment for military purposes. It would also be erroneous to argue that the scale reflected in the plans for the *Queen Elizabeth*-class (before 2010) reflect an overinflated ambition on the part of the Royal Navy; rather, the rationale for the future carriers reflected long-term trends in British and international thinking on the roles and utility of carrier airpower. It also reflected the analysis of valuable operational experience gained in the Gulf and Balkans during the 1990s. In addition, the nature of the contemporary and prospective strategic environment indicate a requirement for larger, rather than smaller carriers, which were themselves principally designed for narrowly defined contingencies of the Cold War (in particular, in the case of the British *Invincible*-class, ASW in the North Atlantic against the Soviet Union). The scale of the future carriers was striking due to the reduced size and capability of the *Invincible*-class, which were a compromise solution developed following the conclusions of a debate in, and circumstances of, the 1960s.

As signposted in this chapter and to be discussed further in the following chapters, debates over ownership (highlighted by the period of Royal Air Force/Dual Control in the inter-war period), carrier versus land-based airpower and the general requirement for aircraft carriers, are enduring and either directly or indirectly relevant to contemporary thinking concerning British maritime airpower. It is also important to note, and this should be evident from the preceding analysis, that despite the Royal Navy clearly articulating the utility of the future carriers in both the maritime and wider strategic contexts, policy-makers have not recognised or fully understood the strategic utility of carrier airpower. As a consequence, policy since 2010 toward the development of Britain's future carrier airpower has taken on a greater degree of risk and will deliver substantially less capability. This is especially the case with regard to the variant of JCA to be acquired for the fixed-wing component of the carrier's air group and will be discussed in the next chapter. Having set out in this chapter the rationale for developing CVF, the development of the ships and their intended air groups to fulfil this vision will be the subject of the next chapter.

4. The Future Aircraft Carrier Programme: Design, Development and Debate

Introduction

The purpose of this chapter is to examine the design and development of what would become the *Queen Elizabeth*-class aircraft carriers under the auspices of the Future Aircraft Carrier (CVF) programme. In order to do this, the chapter first examines the design and development of the ships themselves and particularly focuses on the debate over whether to configure the ships for short take-off and vertical landing (STOVL), short take-off but arrested recovery (STOBAR) or catapult-assisted take-off but arrested recovery (CATOBAR) operations. Proceeding from this, the chapter examines the debate concerning the type of fixed-wing combat aircraft to be acquired for the new aircraft carriers, including the 2002 decision to select a STOVL aircraft and the 2010 change of course to a CATOBAR option. The chapter then considers the decision taken in May 2012 to again revise the choice of ship configuration (reverting from CATOBAR to STOVL) and thus the choice of embarked combat aircraft. The content and trajectory of these debates, as will be discussed below, highlight several key points, namely, contrasting perspectives on the roles and utility of carrier airpower at the Service and inter-Service level;[1] the composition of, and direction of investment in British airpower; and the contribution of maritime forces to British strategy. Moreover, the debates, especially with regard to the variant of Joint Combat Aircraft to be acquired, also shed light on the roles and influence of core actors (in particular Rolls Royce and BAE Systems) in the defence industrial sector on defence procurement, and raise questions pertaining to the efficacy of government policy making. The two inter-linked debates, underway since 1998 and likely to persist into the carriers' service careers,[2] have significant

[1] That is, within the Royal Navy itself and between the Royal Navy and Royal Air Force.
[2] The decision in May 2012 to revert to a short take-off and vertical landing configuration for the *Queen Elizabeth*-class raises questions with regard to the long-term provision of a carrier strike capability. This is due to the F-35B (the aircraft which will provide the fixed wing component of the ship's air group) having an out-of-service date of circa 2042, whereas the ship(s) are expected to remain in service until circa 2070. The debate on whether to convert the ship(s) to a CATOBAR

implications for British carrier-based and wider airpower, maritime and grand strategy, and long-term Defence policy.

The preceding chapter examined the roles and utility of, and rationale for aircraft carriers in general strategic terms. This chapter builds upon that analysis and considers the development of what would become the *Queen Elizabeth*-class within the context of British strategic and operational requirements. The policy benchmarks established in the 1998 Strategic Defence Review (SDR) and the 2010 Strategic Defence and Security Review and National Security Strategy (SDSR) provide the overall framework within which British military strategy has developed. The SDR defined the UK's scale of effort in the following terms:

> We cannot predict the crises we will face. Our forces are our insurance against the unexpected. We must not skimp on the premium because we will pay a heavy price if we get it wrong. At the same time we cannot afford the luxury of having additional forces 'just in case'. Our objective is to meet our purely national requirements and be able to make a reasonable contribution to multi-national operations in support of our foreign and security policy objectives. On this basis, we have set some broad benchmarks for the scale of our planning...we should be able to: respond to a major international crisis which might require a military effort and combat operations of a similar scale and duration to the Gulf War when we deployed an armoured division, 26 major warships and over 80 combat aircraft.[3]

The SDSR reduced the scale of effort envisaged for Her Majesty's Armed Forces, but preserved the commitment to an expeditionary approach to operations (although with a greater focus on small-scale operations). The Defence Planning Assumptions promulgated in the SDSR state:

> The new Defence Planning Assumptions envisage that the Armed Forces in the future will be sized and shaped to conduct: an enduring stabilisation operation at around brigade level (up to 6,500 personnel) with maritime and air support as required, while also conducting: one non-enduring complex intervention (up to 2,000 personnel), and one non-enduring simple intervention (up to 1,000 personnel); or alternatively: three non-enduring operations if we were not already engaged in an enduring operation; or: for a limited time, and with sufficient warning, committing all our effort to a one-off intervention of up to three brigades, with maritime and air support (around 30,000, two-thirds of the force deployed to Iraq in 2003).[4]

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configuration may thus arise again in the 2030s to determine whether the ship(s) remain capable of fixed wing operations beyond 2042 (sixth generation air systems are likely to require a CATOBAR configuration). Navy Command Carrier Strike Briefing Presentation, May 2012.

[3] Ministry of Defence, *The Strategic Defence Review*, Cm 3999 (London: The Stationery Office, 1998), pp.31-32.

[4] HM Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (SDSR), Cm 7948 (London: The Stationery Office, October 2010), p.19.

The reduced scale of effort outlined in the SDSR has resulted in the reduction in size of the planned air-group for the new aircraft carrier(s)[5] and the development of the concept of Carrier Enabled Power Projection (CEPP); the latter replacing the Royal Navy's previously separate Carrier Strike and Amphibious Task Groups (see chapter two, page 93). The carrier programme however was fortunate to avoid cancellation, as at the time of the SDSR it was under intense pressure due to a combination of countervailing factors, namely relating to the financial environment and the on-going campaign in Afghanistan. This will be discussed at length in chapter six. Moreover, in part due to inter-service rivalries but as discussed in the preceding chapter, also due to a less than full understanding of the roles and utility of aircraft carriers, the rationale for acquiring a Carrier Strike capability was questioned. In this light, the chapter seeks to evaluate whether the developmental path chosen for the future aircraft carrier programme constituted the most effective (in terms of cost and capability) option for Britain; that is, what capability would be most suitable both to fulfil UK requirements and also to make a 'reasonable contribution' to multi-national operations?

Developing CVF

The purpose of this first section of the chapter is, as explained above, to examine the development of the Future Aircraft Carrier programme, in particular with regard to the debate on ship configuration. The 1998 SDR established the context guiding the development of the Future Aircraft Carrier programme and set out an outline vision for the ships, stating:

> The emphasis is now on increased offensive air power, and an ability to operate the largest possible range of aircraft in the widest possible range of roles. When the current carrier force reaches the end of its planned life, we plan to replace it with two larger vessels. Work will now begin to refine our requirements but present thinking suggests that they might be of the order of 30,000-40,000 tonnes and capable of deploying up to 50 aircraft, including helicopters... No decisions have been taken on a future carrier-borne aircraft but a version of the Joint Strike Fighter currently under development in the United States remains a strong contender.[6]

The SDR did not determine whether the ships would be configured for STOVL, STOBAR or CATOBAR operations. The vision articulated for the ships in the

[5] See Ibid., p.23.
[6] Supporting Essay Six, 'Future Military Capabilities', in Ministry of Defence, *The Strategic Defence Review*, Cm 3999 (London: The Stationery Office, 1998), pp.143-144, para 27-28.

SDR points toward a decision to pursue, what would be for Britain, a higher level of capability. Malcolm Bird, then responsible for developing a carrier line of business within BAeSEMA (a former component of what is now BAE Systems), stated at a conference in March 1997 on 'British Naval Aviation in the 21st Century' hosted by the Centre for Defence and International Security Studies at Lancaster University, that the UK was considering for its CVF programme, 'whether the carrier should operate 20, 25, 30 or 40 aircraft...'[7] Also considered were adopting a converted container ship design or stretching the *Invincible*-class.[8]

The main purpose of CVF was to provide a medium-scale air capability, with the size of the carriers being determined by the required weight of offensive airpower, calculated to be 36 fast jets undertaking two sorties per day for five consecutive days.[9] The medium scale air capability was defined as 36 'force elements at readiness' (the planning tool used to determine force readiness).[10] Thirty-six embarked fast jets would provide nine four-ship groups, with 32 aircraft assigned to the offensive strike role and four providing air defence.[11] Anti-submarine warfare (ASW) helicopters would also be embarked. The *Queen Elizabeth*-class are not intended to be 'traditional aircraft carriers', rather they are an 'airfield option' for the deployment of Britain's expeditionary F-35 force.[12] In this respect, the ships were not intended to be Fleet carriers or platforms for operating fixed-wing airborne early warning (AEW) aircraft nor to defend the fleet.[13]

By means of comparison, the fourth *Ark Royal* (Britain's last conventional aircraft carrier, decommissioned in 1978) embarked an air-group consisting of 12 Phantom FG1s, 15 Buccaneer S2s, seven Sea King HAS1 ASW helicopters and four Gannet AEW aircraft, that is, 38 fixed and rotary-wing aircraft.[14] *Ark Royal* displaced 43,000 tons (light) and in excess of 50,000 tons when fully fuelled,

[7] Malcolm Bird, 'British Naval Aviation Equipments [sic] – An Industrial Perspective', in Professor Martin Edmonds (ed.), 'British Naval Aviation the 21st Century', *Bailrigg Memorandum* (CDISS, 1997), pp.32-38.
[8] Nick Childs, *Britain's Future Navy* (Barnsley: Pen and Sword Maritime, 2012), p.71.
[9] Interview with Admiral Sir Jonathon Band, London, 23 June 2014.
[10] Interview with retired senior MoD official, London, 10 June 2014.
[11] Ibid.
[12] Interview with retired senior MoD official.
[13] Interview with retired senior Royal Air Force officer, 17 June 2014.
[14] Eric Grove, *Vanguard to Trident: British Naval Policy Since World War II* (London: Bodley Head, 1987), pp. 310-311.

stored and with the air-group embarked.[15] The cancelled CVA-01, in contrast, would have displaced 54,500 tons (fully loaded) and embarked an air-group of 47, comprising 36 Phantoms and Buccaneers, four AEW aircraft and seven helicopters.[16] The process of making the CVF design adaptable (see below) added significant weight to the ships; there were also moves from some quarters to increase the size of the ships in order to gain a fixed wing AEW and air-to-air-refuelling capability thereby moving CVF into a different league of carrier.[17]

Aside from determining the size and displacement of CVF and the strength of its projected air-group, the nature of the propulsion system to be used in the new carriers also required consideration. The option of developing CVF as a nuclear-powered vessel was examined in the very early stages of the programme.[18] Nuclear propulsion offers significant through life cost advantages, including reduced fuel costs, increased aviation fuel capacity and a reduced requirement for replenishment at sea.[19] However, equipping CVF with a nuclear propulsion system would have required either the development of a bespoke reactor for the two aircraft carriers at significant cost, or the use of reactors based on those fitted in the *Vanguard*-class Trident-armed submarines.[20] The latter option would have necessitated the use of three reactors per ship in order to generate sufficient power;[21] in contrast, the US *Nimitz*-class CVNs are powered by two reactors.[22] Captain D. J. I. Garstin, Royal Navy, writing in *The Naval Review*, asks the question of whether it would have been feasible to import US-designed reactors for use in CVF;[23] this option, to be feasible, would likely require the compatibility of a US reactor with existing British infrastructure, which is geared toward supporting submarine propulsion systems. The development of the necessary shore infrastructure to build and support a CVNF was estimated to be equivalent

[15] Rowland White, *Phoenix Squadron* (London: Corgi Books, 2010), p.46.
[16] David Faddy, 'The Cancellation of CVA-01 and the Initiation of the Future Carrier (CVF)', *Defence Studies*, Vol.9, No.3 (September 2009), pp.329-353.
[17] Interview with retired senior Royal Air Force officer.
[18] Interview with Admiral Sir Nigel Essenhigh, Fareham, 29 May 2014.
[19] Interview with Rear Admiral Tom Cunningham CBE, (then) Rear Admiral Fleet Air Arm, Portsmouth, 16 May 2012.
[20] Ibid.
[21] Ibid.
[22] 'Nimitz Class Aircraft Carrier', http://www.naval-technology.com/projects/nimitz/. Accessed 8 September 2013.
[23] Captain D. J. I. Garstin, Royal Navy, 'The Future Aircraft Carrier', *The Naval Review*, Vol.87, No.3 (July 1999), pp.229-234.

to the cost of at least one conventional carrier, which at the time of the studies into nuclear propulsion (1998), was projected to be in the region of £1.4 billion.[24] It was therefore decided to proceed with the development of CVF as a conventionally powered aircraft carrier utilising the innovative integrated full electric propulsion system. All options were considered in the course of developing the carrier programme,[25] including potential cooperation with France. This was with respect to French interest in building a third CVF, configured for CATOBAR operations, in order to provide the French Navy with a second aircraft carrier, complementing the nuclear-powered *Charles De Gaulle*. The option of constructing carrier modules in France was considered, as was assembly at the DCNS (France's leading naval defence company) Saint-Nazaire shipyard.[26]

As stated in the preceding chapter, the core purpose of carrier airpower is to provide affordable, independent and strategically credible deployable airpower.[27] On this basis, determining the nature and scale of embarked aviation capabilities is of central importance in the development of an aircraft carrier. In the context of CVF, this aspect, in particular the nature of embarked operations, that is, STOVL, STOBAR or CATOBAR, formed a critical area of debate. This debate, to a significant extent, went beyond determining the type of aircraft carrier and embarked aircraft that would fulfil the CVF requirement, having implications for the balance and development of wider British airpower. This was especially so with regard to the implications of selecting the CATOBAR option for CVF.[28] In the context of discussing the potential future utility of Joint Force 2000, Wing Commander Neil Meadows, RAF, described the CATOBAR option for CVF in the following terms:

> ...The procurement of a CTOL [conventional take-off and landing,] FAC [Future Aircraft Carrier]/FCBA [Future Carrier Borne Aircraft] combination would allow the aircraft carrier to mount all but the most intensive of air combat operations and would thus radically alter JF 2000's deployment considerations in favour of sea-

[24] Interview with Rear Admiral Cunningham, 16 May 2012.
[25] Interview with retired senior MoD official.
[26] Interview with Admiral Sir Nigel Essenhigh and retired senior MoD official.
[27] Interview with Rear Admiral Cunningham, 1 July 2011.
[28] For example, see Rear Admiral Richard Cobbold, 'A Joint Maritime-Based Expeditionary Capability', *RUSI Journal*, Vol.142, No.4 (August 1997), pp.23-30; 'Noah's News', 'The Future of Carrier Aviation', *The Naval Review*, Vol.89, No.3 (July 2001), pp.220-222 and 'CVF – Neither a Gold Plated Solution nor a Top End Requirement', *The Naval Review*, Vol.89, No.4 (October 2001), pp.312-314; and Wing Commander Neil Meadows RAF, 'To Sea or Not To Sea: That is the Question', *Air Power Review*, Vol.3, No.1 (Spring 2000), pp.82-106.

> borne operations. Only in its prospective CTOL form, therefore, would JF 2000 become the 'deployable and effective offensive air capability' which the SDR envisaged, fully able to fulfil the expeditionary roles of the post-Cold War era as a true instrument of political choice, and able to operate *equally effectively from aircraft carriers and land bases* in all but the most intense of conflicts.[29]

That is, the development of CVF as a CATOBAR-equipped carrier and thus the acquisition of conventional naval aircraft, rather than STOVL aircraft (which as will be discussed below, are significantly less capable), would enable the Royal Navy and Royal Air Force (RAF) to acquire a common aircraft equally capable of operations from aircraft carriers or land bases. This would allow the then current policy assumption of UK future airpower being provided by three programmes, Typhoon, the Joint Combat Aircraft and FOAS (Future Offensive Air System),[30] to be rationalised into two programmes: Typhoon and a common aircraft for the JCA and FOAS requirements. Moreover, following the merging of the Future Carrier Borne Aircraft (the original FCBA requirement was for 60 aircraft to replace the Sea Harrier[31]) and RAF Harrier replacement programmes to form the JCA programme and with it the requirement for approximately 150 JCA (of which half would be Royal Navy-owned[32]), the quantitative and particularly qualitative contribution of the Fleet Air Arm to British airpower would increase substantially. This is particularly highlighted if it is considered that a CVF air-group was originally intended to include 36 fixed-wing combat aircraft; such an air-group would constitute a significant contribution to a major UK expeditionary operation, for example, for Operation *Telic* (the 2003 invasion of Iraq), the UK deployed a total of 62 combat aircraft (Harrier GR7, Tornado GR4 and F3), all of which were land-based and operated by the RAF.[33]

The debate on land versus sea-based airpower will be discussed in greater detail below, however it is important to highlight at this stage, the wider policy context for, and implications of, the debate on which aircraft carrier configuration to proceed with. In general terms, the debates on carrier configuration and deriving from that, which variant of the Joint Combat Aircraft to acquire, were focused on

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[29] Wing Commander Neil Meadows RAF, 'To Sea or Not To Sea: That is the Question', *Air Power Review*, Vol. 3, No.1 (Spring 2000), pp.82-106. Emphasis added.
[30] Interview with Rear Admiral Cunningham, 1 July 2011.
[31] Ibid.
[32] Interview with Captain Jock Alexander OBE Royal Navy, (then) Naval Staff – Assistant Head Carrier Strike and Aviation, London, 3 May 2012.
[33] 'UK Airpower in the Gulf', *Air Forces Monthly* (May 2003), p.6.

the respective merits (military, political, economic and industrial) of STOVL vis-à-vis CATOBAR. There were a number of lobbies involved in this debate: a strong naval, principally Fleet Air Arm (FAA), lobby advocating the acquisition of the US F/A-18 Hornet/Super Hornet (requiring CATOBAR); two lobbies within BAE Systems, one advocating a navalised Typhoon (requiring STOBAR), the other advocating the Joint Strike Fighter (JSF, either STOVL or CATOBAR);[34] and the Royal Air Force advocating STOVL JSF.[35]

The STOBAR option, as will be discussed below, was considered both in the formative stage of the CVF programme and again, as a potential alternative to the US-led F-35 programme in the mid-2000s.[36] Although not occupying as central a position in the carrier debate as STOVL versus CATOBAR, the STOBAR option is significant not least for its implications for understanding the technical requirements for carrier-borne aircraft and its relevance to international carrier programmes (Russia, China and India all operate or are awaiting delivery of Soviet-built STOBAR aircraft carriers).

The STOBAR Option

An aircraft carrier built to a STOBAR configuration incorporates a forward ski-jump to assist the short take-off of a fixed-wing aircraft (instead of utilising a catapult-launching system), and an angled flight deck with arrestor wires (as per a conventional CATOBAR carrier) to enable the arrested recovery of fixed-wing aircraft. At present, the only STOBAR aircraft carrier in operational service is the Russian Navy's *Admiral Kuznetsov* (defined in Russian terminology as a heavy aircraft-carrying cruiser), which operates naval derivatives of the Sukhoi 27 Flanker and Sukhoi 25 Frogfoot (the Su-33 and Su-25UTG respectively) alongside embarked helicopters.[37] Although a STOBAR carrier is, due to the absence of a catapult-launching system, of simpler design than a CATOBAR ship,

[34] Interview with Admiral Sir Nigel Essenhigh.
[35] Interview with retired senior Royal Air Force officer.
[36] House of Commons Defence Committee (HCDC), *Future Carrier and Joint Combat Aircraft Programmes*, Second Report of Session 2005-06, HC 554 (London: The Stationery Office, 2005), p.31.
[37] *Russia's Naval Ships, Armament and Equipment* (Moscow: Military Parade, 2009), pp.32-33; and Yefim Gordon, *Russian Air Power: Current Organisation and Aircraft of all Russian Air Forces* (Hinckley: Midland Publishing, 2009), pp.206-207. For an overview of the development of naval Flanker, see Andrei Fomin, *Su-27 Flanker Story* (Moscow: RA Intervestnik, 2000).

the need for a fixed-wing aircraft to launch from the carrier under its own propulsion results in reduced performance, in particular with regard to range and payload (as with STOVL aircraft).[38] STOBAR operations require more deck space than CATOBAR to enable the short take-off run and require an arrested recovery; in addition, STOBAR operations are also more susceptible to wind, tide, rolling and pitching.[39] In operational terms, due to the constraints imposed on aircraft by the need to perform a short take-off, a STOBAR carrier is more suited to providing a sea control capability (with its embarked fixed-wing aircraft providing air defence and to an extent anti-shipping capabilities and helicopters providing ASW), rather than a power projection capability. This is highlighted by Russian experience and China's initial efforts to develop a nascent aircraft carrier capability.[40]

In the British context, the STOBAR option for CVF is associated with the viability of a naval variant of the Eurofighter Typhoon, which was considered as part of the Joint Combat Aircraft programme.[41] At first glance, a naval variant of the Typhoon, a core element of the RAF's long-term force structure, would have appeared to be a leading contender for the FCBA/JCA requirement on the basis of maximising the return on a substantial investment[42] and ensuring commonality with the RAF. Traditionally, naval aircraft have required significant airframe strengthening to endure the rigours of launching from and recovering aboard aircraft carriers. Efforts to adapt land-based designs for ship-borne operations have tended either to fail (for example, the US F-111B) or require such extensive modification as to constitute essentially new aircraft.[43] A navalised Typhoon would have required a redesigned thicker wing to lower its stalling speed (necessary for recovering aboard a carrier); a significantly altered undercarriage (to cope with the rigours of carrier launch and recovery); and an improved land

[38] Nan Li and Christopher Weuve, 'China's Aircraft Carrier Ambitions: An Update', *Naval War College Review*, Vol.63, No.1 (Winter 2010), pp.13-32.
[39] Ibid., p.24.
[40] Ibid.
[41] HCDC, *Future Carrier and Joint Combat Aircraft Programmes*, p.25; and Richard Scott, 'Future Carrier-Borne Aircraft', *Jane's Defence Weekly*, Vol.38, No.10 (9 September 1998), pp.64-68.
[42] The total cost of the Typhoon programme is estimated to be £20.2 billion. National Audit Office, *Management of the Typhoon Project*, HC 755, Session 2010-2011 (London: The Stationery Office, March 2011), p.23, para 2.2.
[43] The T-45 Goshawk, based on the BAE Systems Hawk jet trainer, is a case in point.

attack capability (at this stage, the aircraft was principally configured for the air-to-air mission).[44] The development of a navalised Typhoon would thus have entailed significant cost and not provided a level of capability equivalent to that of the F/A-18 (purpose-built for carrier operations) or JSF, which in addition to being designed for sea-based operations, was also a fifth generation aircraft, a key point which will be discussed further below.

Comparing STOVL and CATOBAR

The debate on whether to pursue the STOVL or CATOBAR option for the future aircraft carriers and their air groups is no mere technical detail but is of central importance to understanding the development of the carrier programme in its broadest context. This includes the associated Joint Combat Aircraft and Future Organic AEW/Maritime Airborne Surveillance and Control (MASC) programmes, the role of carrier airpower in British strategy and the long-term trajectory and balance of British airpower. The outcome of the debate would determine the design of the ships to be built; the type and capability of the aircraft to be embarked; the roles the ships would be capable of undertaking and thus their utility to British strategy; and the balance of British fixed-wing combat air capability to be provided by sea and land-based aircraft respectively. Prior to examining the debate, a brief summary, in generic terms, of STOVL and CATOBAR ship configurations and the respective associated aircraft types are provided.

An aircraft carrier designed for STOVL operations will typically be of simpler design, due to the absence of catapults and arresting gear, than a CATOBAR carrier. It may also incorporate a ski-jump (as, for example, in the British *Invincible*-class or Spanish *Principe de Asturias*) to improve short take-off performance;[45] although not required, an angled flight deck may also be incorporated in order to enable rolling vertical landings (as opposed to a vertical landing), thereby improving vertical landing bring-back performance (the weight

[44] Interview with Admiral Sir Nigel Essenhigh.
[45] For discussion of the development of the ski-jump and the benefits it confers on STOVL operations, see David Hobbs, *A Century of Carrier Aviation: The Evolution of Ships and Shipborne Aircraft* (Barnsley: Seaforth, 2009), pp.261-264 and p.272 for the compatibility of conventional aircraft with ski-jump assisted take-offs.

of payload permitted for a vertical recovery).[46] Rear Admiral Richard Philips, then Assistant Chief of Defence Staff (Operational Requirements (Sea)), described at the aforementioned 'British Naval Aviation in the 21st Century' conference, the advantages of STOVL as: 'STOVL operations use less space on the flight deck, enabling use of smaller hulls which are less weather dependent – since, when the weather deteriorates, the aircraft's recovery position can be moved to the midship [sic] area where deck movement is minimised'.[47] Further, as Commander David James, Royal Navy, stated with regard to STOVL: 'Flight operations are less affected by sea state than in a CTOL or STOBAR ship. This is because the STOVL aircraft establishes a hover alongside the ship and can choose the deck area with least motion and await a quiescent period before committing to the final landing'.[48] Moreover, because the recovery boarding rate for STOVL operations is expected to be more assured than for arrested recoveries, an organic air-to-air refuelling capability has not traditionally been required – although would prove useful to de-risk recoveries of large formations of STOVL aircraft.[49] A STOVL deck is also more versatile and offers greater tactical flexibility, in particular as it is not bound by the launch and recovery cycle associated with a CATOBAR deck.[50]

David Jordan has cited an additional potential benefit of naval STOVL aircraft:

> A 1992 report by the Center for Naval Analyses suggested that naval STOVL aircraft could undertake 25 percent [sic] more sorties than a conventional-takeoff [sic]-and-landing type over a five-hundred-nautical-mile radius in a twelve-hour period; if the radius of action were reduced to 250 nautical miles, the STOVL type could generate 40 percent [sic] more.[51]

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[46] Commander D. R. James, Royal Navy, 'Carrier 2000: A Consideration of Naval Aviation in the Millennium – II', *The Naval Review*, Vol.87, No.2, (April 2009), pp.105-113. For background information on ship-borne rolling vertical landing (SRVL), see Richard Scott, 'Seeking the Third Way: UK Considers Rolling Vertical Landing for its F-35Bs', *Jane's Navy International*, Vol.113, No.3 (April 2008), pp.14-15. At present, no STOVL carrier in service features an angled flight deck.

[47] Rear Admiral R. T. R. Philips, 'Naval Aviation in a Changed Strategic Environment', in Professor Martin Edmonds (ed.), 'British Naval Aviation the 21st Century', *Bailrigg Memorandum* (CDISS, 1997), pp.13-23, quotation, pp.18-19

[48] James, 'Carrier 2000 – II', pp.108-109.

[49] I am grateful to Commander Henry Mitchell, Royal Navy, for this insight.

[50] Interview with retired senior MoD official.

[51] David Jordan, 'Future Carrier Aviation Options: A British Perspective', *Naval War College Review*, Vol. LIV, No.3 (Summer 2001), pp.63-84, quotation, p.76.

However, as Major John Jordan, United States Marines Corps, highlights, citing US Navy and Marines Corps experience concerning aircraft availability and maintainability:

> CVTOL [carrier take-off and landing] aircraft availability is historically 80 percent [sic], while STOVL availability is only 63 percent [sic]. "Thus one might build a case that fewer sorties may be generated using STOVL aircraft rather than CVTOL. This is a far cry from the 23% STOVL advantage claimed by [the Center for Naval Analyses]."[52]

It is suggested that the reduced availability of STOVL aircraft is due to their added complexity (associated with making an aircraft capable of STOVL operations) thus increasing the incidence of technical failure.[53] However, a source with extensive operational experience on both conventional land-based and STOVL aircraft has stated that, in his experience, service availability for STOVL aircraft is comparable to that of conventional aircraft, and where there have been issues with availability, it is due to factors not related to the STOVL system.[54]

The F-35 programme, although still in testing, offers the following valuable insight with regard to the potential difference in reliability between a STOVL and conventional aircraft: '[the] Demonstrated Mean Flight Hours Between Critical Failure for the F-35A [conventional take-off and landing] was 5.95 hours, for the F-35B [STOVL] was 4.16 hours, and for the F-35C [carrier variant] was 6.71 hours...'[55] It must be noted that these figures are derived from testing and do not represent expected operational performance, but most significantly, the F-35B is expected to have a shorter time between critical failure compared to that for the F-35C with a concomitant effect on aircraft availability. In the same light, repair times for the STOVL aircraft are longer than those of the carrier variant, at 5.3 hours and 4.0 hours respectively.[56] Thus, although more STOVL aircraft can be launched and recovered within a given period than for CATOBAR, historic (and likely future) availability will result in, for the same number of aircraft,

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[52] Major John O. Jordan, USMC, *Marine TacAir and the STOVL Penalty: Myth or Menace?* Student Research Paper, United States Marine Corps Command and Staff College (April 2001), p.35. Retrieved via http://www.dtic.mil.
[53] See Ibid for discussion of this subject, in particular pages 31-36.
[54] Interview with retired senior Royal Air Force officer.
[55] Director, Operational Test and Evaluation (US Department of Defense), 'F-35 Joint Strike Fighter (JSF)' in *FY 2012 Annual Report* (The Office of the Director, Operational Test and Evaluation: December 2012), p.41, http://www.dote.osd.mil/pub/reports/FY2012/. Accessed 6 September 2013.
[56] Ibid., p.42.

CATOBAR operations being sustained for longer and with less logistic drag whereas STOVL aircraft will experience technical failure more readily and or require greater effort to sustain operations – in addition to inherent performance differences.[57]

As will be discussed below with specific reference to the F-35, STOVL aircraft have reduced performance, in particular with regard to range, payload, combat persistence and target coverage, compared to conventional aircraft. Further, the choice of a STOVL configuration for an aircraft carrier currently limits the choice of organic enabling assets, especially AEW/ISTAR,[58] to a rotary-wing system. Tilt-rotor aircraft such as the V-22 (see below) and hybrid air vehicles may, with sufficient investment, address this limitation.[59] The implications of a helicopter-based MASC solution are identified by Lieutenant Commander David South, Royal Navy:

> The helicopter's performance will be significantly reduced in comparison [to the land-based E-3 or carrier-based E-2] due to limited endurance, a lack of access to a comprehensive Multi-tactical Data Links (MTDL) suite, constraints on crew size and thus the number of aircraft which can be controlled, and insufficient radio communications to allow multi-tasking with maritime, air and ground forces... CVF launched strike packages will depend on the services of E3 or other navies' E2C aircraft to provide a suitable level of control and direction in a busy and complex operational environment, whilst the MASC will be reduced to a single role platform only capable of limited control in relatively benign airspace.[60]

The development of a V-22 Osprey-based MASC system would significantly contribute to mitigating the above deficiencies, whilst being STOVL capable (the V-22 is a tilt-rotor design which allows it to perform V/STOL operations[61]) but

[57] I am grateful to Commander Mitchell for this insight.
[58] Intelligence, Surveillance, Target Acquisition and Reconnaissance.
[59] The development of hybrid air vehicles may potentially offer the means of providing persistent ISTAR from a platform that is not dependent on a particular ship for operations. See James Bosbotinis, 'The Strategic Utility of the *Queen Elizabeth*-class Aircraft Carriers', *Defence IQ*, 1 March 2012, http://www.defenceiq.com/naval-and-maritime-defence/articles/the-strategic-utility-of-the-queen-elizabeth-class/#.UVBg9hdIg0E (accessed 8 September 2013); Congressional Budget Office, *Recent Development Efforts for Military Airships*, November 2011; and Hybrid Air Vehicles Ltd, 'Military Surveillance', http://hybridairvehicles.com/militarysurveillance.aspx (accessed 8 September 2013).
[60] Lieutenant Commander David South, Royal Navy, 'The Failings of Britain's Future Carrier Strike Programme', *The Naval Review*, Vol.95, No.4 (November 2007), pp.323-329, quotation p.326.
[61] V/STOL – vertical/short take-off and landing. For an overview of the V-22, see 'V-22 Osprey', http://www.boeing.com/assets/pdf/rotorcraft/military/v22/docs/V-22_overview.pdf. Accessed 11 September 2013.

would require major British investment.[62] The provision of an organic ISTAR capability highlights the central weakness of a STOVL carrier, that is, its limited airpower capability. This is not to say that a STOVL aircraft carrier cannot provide a most useful capability – HMS *Hermes* and *Invincible* were, for example, mission critical assets in the Falklands War – but that the capability it can provide will be limited.[63] In this regard, a STOVL carrier constitutes a cost effective option should the capability being sought be of a limited nature, but as will now be discussed, in the context of seeking to acquire a medium aircraft carrier with a significant level of capability, a CATOBAR carrier may be more cost effective and better suited to the vision articulated in the SDR, and reiterated in the SDSR. In the context of developing CVF, 'Noah's News' writing in *The Naval Review*, effectively summarises the essence of the STOVL-CATOBAR choice:

> In making a choice of variant for FCBA, the UK's force projection aspirations must be clearly articulated and understood: is it power projection of maritime offensive air as conducted by USN or French carriers, or expeditionary maritime offensive air operations as advocated by the US Marine Corps? The latter would envisage using aircraft primarily to provide fire support to marine ground forces ashore (Close Air Support) rather than an ability to conduct the full spectrum of offensive air operations.[64]

It also warrants highlighting that in the case of the US Marine Corps, it has been able to develop the niche specialisation of expeditionary maritime offensive air operations because the US Navy and Air Force provide the wider offensive air and general airpower functions that US policy requires. Thus, for the UK, the pursuit of the US Marine Corps-type approach would either require additional capabilities to be provided (at extra cost) by, for example, the RAF, or a reliance on allies for those capabilities.

In contrast to a STOVL aircraft carrier, a ship designed for CATOBAR operations has a catapult-launching system (typically steam-powered but electromagnetic

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[62] For an overview of work undertaken on an ISTAR variant of the V-22 for the US and UK, see Stephen Trimble, 'US Navy Seeks Demonstration of TOSS Radar on V-22 Osprey', *Flight Global*, 20 June 2007, http://www.flightglobal.com/news/articles/us-navy-seeks-demonstration-of-toss-radar-on-v-22-osprey-215013/. Accessed 8 September 2013.

[63] For a useful examination of the capability provided by STOVL carriers, represented by the British *Invincible*-class and Joint Force Harrier, using the framework of the spectrum of conflict, see Meadows, 'To Sea or Not to Sea'.

[64] 'Noah's News', 'The Future of Carrier Aviation', *The Naval Review*, Vol.89, No.3 (July 2001), pp. 220-222, quotation, p.221.

systems are increasingly being used)[65] for fixed-wing aircraft and an angled flight deck with arrestor wires to recover those aircraft. Due to the requirements of catapult-assisted launches and arrested recoveries, a CATOBAR-configured ship will be, to an extent, larger than a STOVL design, a CATOBAR configuration being viable only for ships exceeding 40,000 tons. For a CATOBAR ship, the main design drivers are the catapult-launch system and flight deck arrangements (for launching and recovering aircraft), whilst a STOVL design is driven by the deck length required for the short take-off.[66] Although it is the case that STOVL carriers can be smaller, albeit embarking small air groups, for medium and large carrier designs, the requirements of aviation operations for a given number of aircraft, whether of STOVL or CATOBAR design, result in both STOVL and CATOBAR vessels tending toward similar overall dimensions.[67] Despite the added complexity of the catapult-launching system and arresting gear, the cost difference between a STOVL and CATOBAR carrier is approximately six per cent in both initial construction and life cycle costs.[68] Wing Commander Meadows describes the advantages of a CATOBAR aircraft carrier thus:

> Whilst a CTOL FAC/FCBA combination would be larger… it would, however, offer considerably more in terms of air power projection capability than its STOVL equivalent. An electromagnetic catapult could launch aircraft of all-up weights in excess of 70,000 lbs. It would also enable the use of more capable, fixed-wing AEW aircraft (such as the E-2 Hawkeye) and small AAR [air-to-air refuelling] tankers. The CTOL carrier's arrestor capability would also permit the recovery of its aircraft in most configurations and with significant battle damage.[69]

By using the vision outlined for CVF in the SDR, that is, an aircraft carrier that can provide 'increased offensive air power, and an ability to operate the largest possible range of aircraft in the widest possible range of roles', the advantage of a CATOBAR configuration can be illustrated. With regard to 'increased offensive

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[65] The United States is fitting its new *Gerald R. Ford*-class aircraft carriers with the electromagnetic aircraft launching system (EMALS) and China is believed to be investigating an EMALS-type system for use in a large CATOBAR carrier. See Rebecca Christie, 'Losing Steam: US Navy Carriers Go Electric', *Jane's Navy International*, Vol.113, No.2 (March 2008), pp.14-19; Li and Weuve, 'China's Aircraft Carrier Ambitions', pp. 24-25; and Grace Jean, 'China Plans Next-Gen Carriers', *Jane's Defence Weekly*, Vol.50, No.12 (20 March 2013), p.10.
[66] Interview with Rear Admiral Cunningham, 1 July 2011.
[67] 'CVF Design Evolution Described at RINA Conference', *Warship Technology* (July/August 2009), pp.14-23. This paper is based on a paper delivered by Simon Knight, Platform Design Director in the Aircraft Carrier Alliance, to the Royal Institution of Naval Architects' conference 'Warship 2009: Airpower at Sea'.
[68] J. D. Raber and Dr D. A. Perin, 'Future USN Aircraft Carrier Analysis of Alternatives', *Naval Engineers Journal*, Vol.112, No.3 (May 2000), pp.15-25.
[69] Meadows, 'To Sea or Not to Sea', p.98.

air power', a conventional naval aircraft can carry a greater payload over larger distances, and or spend more time on-station than a STOVL aircraft. Moreover, a CATOBAR carrier can embark specialist force enablers and multipliers such as electronic warfare/defence suppression aircraft (for example, the EA-18G Growler[70]) and as previously noted, more capable ISTAR aircraft (such as the E-2D Hawkeye[71]), thereby enhancing the ability of the carrier's strike fighters to prosecute targets in heavily-defended airspace and those targets which are time-sensitive and or mobile. An ISTAR asset such as the E-2 can also significantly improve situational awareness and understanding of the operating area or battlespace (depending on whether the carrier is undertaking a forward presence or combat tasking) thus aiding wider national or coalition activities. The carrier's organic air-to-air refuelling (AAR) aircraft, in addition to providing the necessary support for arrested recoveries,[72] can also be utilised to extend the reach of the embarked strike fighters. France made use of this tactic to extend the reach of its Super Etendard aircraft flying off the *Charles de Gaulle* for operations over Afghanistan (over 700 miles from the carrier's operating area).[73] The unrefuelled range of the Super Etendard is approximately 750 nautical miles.[74] Furthermore, a CATOBAR carrier can operate the same V/STOL fixed and rotary-wing aircraft that a STOVL carrier can operate (the converse does not apply) and, in the British case, would confer the additional benefit of interoperability with the US and French navies.[75]

The use of a CATOBAR approach, however, incurs some penalties. The naval, predominantly FAA, lobby that advocated a CATOBAR configuration for CVF

[70] 'EA-18G Airborne Electronic Attack Aircraft', http://www.boeing.com/defense-space/military/ea18g/index.html. Accessed 11 September 2013.
[71] Richard Scott, 'Above and Beyond: Next-Generation Hawkeye Readied for Service', *Jane's Navy International*, Vol.117,No. 7 (September 2012), pp.28-31.
[72] Due to the possibility of failed approaches (whether aircraft, pilot or recovery system related) causing a bolter (that is, a missed recovery) and the aircraft needing to attempt to recover again, whilst potentially having to wait for another aircraft to recover (due to fuel priority) or for the deck to be readied, organic air-to-air refuelling is required to enable the aircraft to endure before attempting another recovery. (I am grateful to Commander Mitchell for this insight.)
[73] Lieutenant Commander Jeremy Tyler, Royal Navy, 'What Lessons Can the UK Learn from the *Charles de Gaulle*?', *The Naval Review*, Vol.95, No.3 (August 2007), pp.214-219, specifically p.216.
[74] Marine National, 'Super Etendard Modernisé', http://www.defense.gouv.fr/marine/decouverte/equipements-moyens-materiel-militaire/aeronefs/super-etendard-modernise. Accessed 11 September 2013.
[75] South, 'The Failings of Britain's Future Carrier Strike Programme', p.327.

discounted a lot of arguments pointing to the difficulties of such an approach.[76] It is argued that the launch and recovery cycle associated with CATOBAR operations is a significant constraint, in particular with regard to providing responsive tactical airpower, whilst simultaneous launch and recovery operations are inefficient.[77] In addition, the requirement to maintain a fuel reserve for recovering aboard the carrier, a process supported by organic tanking (see footnote 72), may reduce the time over target for a CATOBAR aircraft; the more assured recovery rate for STOVL highlights the greater flexibility of a STOVL deck.[78] Moreover, CATOBAR deck operations are more labour intensive and complex in comparison to a STOVL deck and more costly.[79]

The Royal Navy's initial thinking on CVF was for a STOVL vessel; however, as the required sortie generation rate was increased and the ship's size grew beyond 40,000 tons, a CATOBAR configuration became viable.[80] Dr Lee Willett, former Head of the Maritime Studies Programme at the Royal United Services Institute for Defence and Security Studies, has noted with regard to the RAF's attitude toward the CVF programme that:

> CVA01 was torpedoed not only by budgetary issues, but also by inter-service rivalry. In recent years, tensions existed between the Royal Navy and RAF over who would 'own' JSF: in other words, is it a carrier-based aircraft that can operate from land, or vice-versa? There were also some very difficult times privately between senior elements of the two services and within the Harrier community over the carrier programme. As the programme developed, however, the RAF did not publicly oppose it, although its support may have been somewhat qualified.[81]

This quotation highlights three issues central to an analysis of the debate concerning British maritime airpower; ownership, sea-basing versus land-basing, and the RAF attitude toward maritime airpower. The issue of ownership will be discussed in chapter five; the issues of sea versus land-basing and the Royal Air Force's perspective toward the carrier programme, although to be discussed in further detail both later in this chapter and in chapter five, are relevant to the discussion to which the chapter now turns, that of the debate concerning which

[76] Interview with Admiral Sir Nigel Essenhigh.
[77] Interview with retired senior MoD official.
[78] Interview with retired senior Royal Air Force officer.
[79] Interview with Admiral Sir Nigel Essenhigh.
[80] Interview with Rear Admiral Cunningham, 1 July 2011.
[81] Lee Willett, '"More Than Just Spare Airfields": Defence Policy, Defence Reviews and the Queen Elizabeth-class Aircraft Carriers', in Tim Benbow (ed.), *British Naval Aviation: The First 100 Years*, (Farnham: Ashgate, 2011), pp.197-226, quotation, p.224.

variant of F-35 to acquire to meet the JCA requirement and thus determine whether CVF would be equipped for STOVL or CATOBAR operations.

The Joint Combat Aircraft Variant Debate

The Lockheed Martin F-35 was selected to meet the JCA requirement in January 2001;[82] the particular variant would be determined subsequently. The F-35 is an advanced fifth generation aircraft, developed to fulfil the requirement of providing the US Air Force, Navy and Marine Corps and international partners with a Joint Strike Fighter; this has resulted in the development of three variants – the F-35A (conventional take-off and landing, land-based), F-35B (STOVL) and F-35C (CATOBAR).[83] The UK is the only 'Level 1' partner in the US-led programme. This is based on a $2 billion investment in the System Development and Demonstration Phase that provides Britain with the right to 'bid for work on a best value basis, and participate in the aircraft's development'.[84] BAE Systems is a principal sub-contractor (alongside the US company Northrop Grumman) to Lockheed Martin for F-35 production. It is responsible for the design and production of the aft section of all three variants of the aircraft in addition to other aspects of the F-35's on-board systems,[85] whilst Rolls Royce is responsible for developing the lift system enabling the F-35B's STOVL capability.[86] The significance of the F-35 programme to BAE Systems and Rolls Royce is highlighted by considering that, at the time of writing, in excess of 2,500 F-35s are to be acquired for the US and international customers.[87]

The JCA variant debate was 'heated', in part due to internal competition within the Ministry of Defence between the carrier variant of the F-35 and the RAF's FOAS programme.[88] FOAS was intended to replace the Tornado GR4 in the

[82] The F/A-18E, Rafale M, 'navalised' Eurofighter and an advanced Harrier were also considered. HCDC, *Future Carrier and Joint Combat Aircraft Programmes*, p.24 and p.25.
[83] For an overview of the F-35 programme, see http://www.jsf.mil. Accessed 11 September 2013.
[84] 'F-35', http://www.jsf.mil/f35. Accessed 11 September 2013.
[85] BAE Systems, 'Extended F-35 Military Jet Manufacturing Facility Opened', 23 March 2012, http://www.baesystems.com/article/BAES_045553/extended-f-35-military-jet-manufacturing-facility-opened. Accessed 11 September 2013.
[86] 'Rolls-Royce LiftSystem', http://www.rolls-royce.com/defence/products/combat_jets/rr_liftsystem.jsp. Accessed 11 September 2013.
[87] US Government Accountability Office, 'F-35 JOINT STRIKE FIGHTER: Restructuring Has Improved the Program, but Affordability Challenges and Other Risks Remain', GAO-13-690T, 19 June 2013, http://gao.gov/assets/660/655295.pdf. Accessed 11 September 2013.
[88] Interview with Rear Admiral Cunningham, 1 July 2011.

second decade of the 21st century, having a projected in-service date of 2015-18, and was to be a system of attack platforms both manned and remotely-piloted.[89] Air Commodore (now Air Marshal Sir) Tim Anderson described FOAS as 'our prudent investment in the future that will continue to ensure a sharp tip to the spear as JCA reaches middle age and beyond';[90] this suggests that FOAS was intended to constitute the high-end of future British airpower, providing a level of capability a step-up from that provided by the JCA. The RAF advocated acquiring the F-35B, citing its flexibility and capability; operational analysis following the SDR indicated that the F-35B could reach 70 per cent of all targets that the UK would wish to hold at risk, the remaining 30 per cent could either be reached using Tomahawk or air-launched cruise missiles (such as Storm Shadow) or by the US.[91] It also highlighted continuity with the STOVL Harrier and STOVL as an important niche capability.[92] Further, the RAF was looking at acquiring some land-based F-35As within the 150 F-35s the UK intended to acquire.[93] Although there would be some increased operational costs associated with operating a mixed fleet (the projected through life costs of operating a mixed F-35 fleet were estimated in 2012 to exceed that of a single F-35C fleet by £2 billion[94]), those costs would be balanced by the lower acquisition cost of the F-35A (the F-35A is the least-expensive of the three variants).[95]

It has been suggested that the RAF advocated acquiring the F-35B in order to minimise the strike capability of CVF, thus undermining the case for the carriers, and to create a capability gap that necessitated investment in FOAS.[96] The F-35C, capable of fulfilling both the JCA and FOAS roles, was seen as an 'existential threat' to the RAF as the strike role was central to the RAF ethos;[97] conversely, it warrants mention that there was some support within the RAF for acquiring the F-

[89] Interview with retired senior Royal Air Force officer.
[90] Air Commodore Tim Anderson, 'UK Long Range Offensive Air Power from 2020 and Beyond', *Air Power Review*, Vol.6, No.4 (Winter 2003), pp.39-52.
[91] Interview with retired senior Royal Air Force officer.
[92] Interview with former senior MoD civil servant, London, 10 April 2014.
[93] Ibid.
[94] Navy Command Carrier Strike Briefing.
[95] Interview with retired senior Royal Air Force officer.
[96] Interview with former senior MoD civil servant.
[97] Ibid.

35C.[98] A key aspect of the variant debate was the case put forward by the RAF regarding the importance of being at the heart of the Combined Air Operations Centre for coalition air operational planning, and the imperative of having a 'day one'[99] capability in order to be relevant to the US, thereby gaining campaign influence and boosting the UK position vis-à-vis Washington.[100] This would require a high-end strike system (for example, FOAS) and could only be delivered by the RAF.[101] Air Commodore Anderson highlighted the importance of this latter capability in the context of FOAS:

> Long-range offensive air power will be an essential element of any integrated campaign in anti-access environments...This important element of what can be described as a 'Day One' capability must address the application of effect against the most demanding of targets, probably at extended range from the UK, Sovereign or allies' territories, and in the highest of threat environments...we will clearly wish to watch closely evolving US concepts for timely effect at range to enable, where possible, the UK to meet its desired level and extent of commitment to coalition operations.[102]

This illustrates the point raised by 'Noah's News', and quoted above, regarding the implications of the JCA variant decision. The difference in capability between the F-35B and F-35C is significant. In 2001/02, the F-35B was projected to have a combat radius of 496 nautical miles with an internal payload consisting of two AIM-120 advanced medium range air-to-air missiles and two 1,000 lbs precision-guided munitions.[103] In contrast, the F-35C had a projected combat radius of 799 nautical miles with an internal payload of two AIM-120s and two 2,000 lbs precision-guided munitions.[104] The difference in range and internal payload is due to the space taken by the shaft-driven lift fan integrated with the engine in the F-35B; this reduces the aircraft's internal fuel load to 13,400 lbs compared to 19,145 lbs in the F-35C, and restricts the size of the internal weapons bays on the F-

[98] Interview with retired senior Royal Air Force officer. The option of acquiring a mixed F-35 fleet was also considered as part of the 2012 variant decision. Interview with Captain Alexander.
[99] That is, operations at the start of a conflict, against an adversary's strategic targets defended by a still-intact integrated air defence system.
[100] Interview with former senior MoD civil servant.
[101] Ibid.
[102] Anderson, 'UK Long Range Offensive Air Power for 2020 and Beyond', pp.46-47.
[103] Eric S. Ryberg [then head of the JSF Basing and Ship Suitability Integrated Project Team], 'The Influence of Ship Configuration on the Design of the Joint Strike Fighter', Paper prepared for the 'Engineering the Total Ship' Symposium, US National Institute of Standards and Technology, 2002. Retrieved via http://www.dtic.mil.
[104] Ibid.

35B.[105] The difference in range would also impact on the respective variant's combat persistence (that is, time over target or on-station); data from 2012 suggest that the F-35B has a time over target of 15 minutes compared to 36 minutes for the F-35C.[106] The F-35B would also be more dependent on land-based air-to-air refuelling assets.

The value of the longer range of the F-35C should have been particularly apparent due to then recent operational experience, namely, the first phase of air operations over Afghanistan in autumn 2001 and Operation *Allied Force* over Yugoslavia in 1999. The former involved carrier-launched air operations over ranges of 650 to 750 nautical miles to target:[107] the latter 3,500 nautical mile round-trip sorties by Tornados from Germany.[108] The difference in internal payload between the two variants is especially significant, in particular due to the F-35B's inability to carry 2,000 lbs penetrating munitions. It is argued that this means the F-35B cannot prosecute hardened, strategic targets (for example, command bunkers, bridges and aircraft bunkers) [109] without recourse to carrying external ordnance and compromising the aircraft's low observability. Conversely, it is suggested that the lack of a 2,000 lbs munitions capability has been exaggerated.[110] For example, the UK has a lead in the development of intelligent warheads, which can be used to prosecute hardened targets rather than relying on heavier-weight ordnance:[111] the BROACH warhead fitted to the Storm Shadow cruise missile being a notable example.[112]

However, the unrefuelled reach of the F-35B, even if armed with the Storm Shadow cruise missile (with a range of up to 250 nautical miles[113]), thus compromising the aircraft's low observability, would only extend to a total of 744

[105] Ibid.
[106] Navy Command Carrier Strike Briefing.
[107] Benjamin S. Lambeth, *American Carrier Air Power at the Dawn of a New Century*, (RAND Corporation, 2005), pp.ix-x.
[108] Anderson, 'UK Long Range Offensive Air Power for 2020 and Beyond', p.46.
[109] Navy Command Carrier Strike Briefing.
[110] Interview with retired senior MoD official.
[111] Ibid.
[112] Bomb Royal Ordnance Augmented Charge – is a tandem warhead system optimised for penetrating heavily reinforced targets. Conventionally Armed Stand-Off Missile Integrated Project Team, 'Storm Shadow – The System to Hit Hard Targets', *World Defence Systems*, Vol.6, No.2 (August 2003), pp.72-76.
[113] Lee Willett, 'Tactical Tomahawk: Evolution or Revolution', *World Defence Systems*, Vol.6, No.2 (August 2003), pp.77-81.

nautical miles; less than the F-35C armed with internal ordnance and therefore capable of operating within an adversary's airspace on 'day one' operations.

Further, as Robert Hewson, then editor of *Jane's Air-Launched Weapons*, wrote in 2004:

> It is uncertain just how many of the UK's desired weapons options will now fit in the redesigned aircraft [the F-35B had to be redesigned in order to reduce its weight and thus preserve its STOVL capability], but there are clearly some serious implications. This comes at a time when UK industry (led by MBDA Missile Systems) already faces an uphill struggle in convincing the US to integrate non-US systems in the first place.[114]

This highlights another aspect of the variant debate: that of industrial interest. Richard Scott, naval editor for *Jane's Defence Weekly*, has described the original 2002 variant decision in favour of the F-35B,[115] as 'very finely balanced' and in part influenced by 'the industrial interests of Rolls-Royce and BAE Systems'.[116] As previously noted, Rolls-Royce is responsible for the development and manufacture of the STOVL lift system in the F-35B. In 2002, Rolls-Royce was 'not in great shape';[117] the Rolls-Royce developed 'LiftSystem' was seen as providing an opportunity to ensure UK involvement in the STOVL variant and make the UK indispensable to the programme.[118] Moreover, it would highlight to the US that the UK was a credible partner: there was a distinct lure associated with gaining 'Level 1' partner status in the JSF programme, a political appeal deriving from the potential industrial benefits and the national prestige of being linked with the US in such a high-profile programme.[119] In the case of BAE Systems, it is suggested that RAF lobbying was a key driver, focusing on the capability gap that would exist with the procurement of the F-35B, thus leaving space for investment

[114] Robert Hewson, 'Joint Strike Fighter', *Jane's Defence Weekly*, Vol.41, No.41 (13 October 2004), pp.26-29, quotation, p.28.
[115] Announced in September 2002 by the Secretary of State for Defence. HCDC, *Future Carrier and Joint Combat Aircraft Programmes*, p.24.
[116] Richard Scott, 'UK Reviews JSF Variant Choice', *Jane's Defence Weekly*, Vol.42, No.27 (6 July 2005), p.4. The involvement of Rolls-Royce in the decision to select the STOVL variant was also raised by Vice Admiral Sir Jeremy Blackham (interview, 13 February 2012). Between 1999 and 2002, Vice Admiral Blackham was Deputy Chief of the Defence Staff (Equipment Capability).
[117] Interview with former senior MoD civil servant.
[118] Ibid.
[119] Ibid.

in FOAS (which was as important to the RAF as it was to BAE Systems) and novel technologies.[120]

At the political level, factors influencing the decision to select the F-35B included a projected earlier in-service date (2012, at that time, also the projected in-service date for the first-of-class of CVF), increased operational flexibility and what were expected to be greater benefits for British companies.[121] In addition, the head of the JSF programme office in the United States in 2001 was a US Marine Corps general – Major General Michael Hough; the US Marine Corps (USMC) is the principal customer for the F-35B, and a desire to gain influence in the programme office contributed to Britain's decision to opt for the STOVL variant.[122] The selection of the F-35B would create a symbiotic link with the USMC in defending the continued development of the STOVL variant.[123] Further, the USMC was lobbying 'very hard' in the UK in favour of the F-35B.[124] As has been discussed above, the 'greater benefits for British companies' is debateable (especially with regard to MBDA) and in many respects, the F-35B offers less operational capability than the F-35C. The earlier projected in-service date, although nominally an advantage, does not consider the element of technical risk in the STOVL programme, which was of sufficient concern to warrant the development of CVF as an adaptable carrier, that is, initially configured for STOVL but designed to be refitted for CATOBAR operations.[125] In the event of significant delay or failure of the STOVL variant, the only STOVL fall-back option would be continued use of the Harrier; in the event of a delay or failure of the F-35C, fall-back options would potentially include the lease/acquisition of the F/A-18E/F or the French Rafale-M.

The decision to develop CVF as an adaptable design also meant that a key advantage of opting for a STOVL ship-air system – a smaller, less expensive ship – was not available. Furthermore, the through-life costs of the F-35C were

[120] Ibid.
[121] Scott, 'Seeking the Third Way', p.14.
[122] Interview with Vice Admiral Sir Jeremy Blackham.
[123] Interview with former senior civil servant.
[124] Interview with Admiral Sir Nigel Essenhigh.
[125] Interviews with Rear Admiral Cunningham, 1 July 2011 and Commander Mitchell, 2 November 2010. Also see 'CVF Design Evolution Described at RINA Conference'.

forecast to be much lower than those of the F-35B,[126] whilst the unit costs were in 2001/02, predicted to be $45.8 million for the F-35B and $47.8 million for the F-35C.[127] The difference in unit cost, spread over a projected 150 aircraft JCA fleet, would amount to the F-35C option costing $300 million more than the F-35B. However, the F-35C could also provide the manned component of FOAS, therefore allowing the RAF to streamline its future force structure to two principal fast jet types (thus enabling efficiency savings); the Typhoon and F-35C, rather than the planned three fast jet force, that is, Typhoon, F-35B JCA and FOAS. The ability of the F-35C to fulfil the FOAS role is alluded to by the National Audit Office in its 2011 report on Carrier Strike, where it states that the F-35B could not fulfil the deep and persistent operational capability (DPOC) requirement (successor to the FOAS programme), whereas the F-35C could.[128]

The selection of the F-35B and decision to configure CVF for STOVL operations, albeit with a view to the potential refit of CATOBAR equipment at some point in the future, would, although offering a substantial increase in capability over that provided by the Sea Harrier/Harrier combination, 'perpetuate the inherent air power limitations...which would continue to restrict ship-borne air operations to a far smaller scale than would be possible from a land base'.[129] It would also limit the MASC programme to a rotary wing solution (unless a tilt rotor option was developed).[130] The MASC requirement did not have a significant role in determining whether to develop CVF as a STOVL or CATOBAR carrier and the reason for this sheds light on the perceived role of the carriers. That is, the focus for the ships would be the delivery of offensive air power against the land – the AEW requirement was seen as less relevant as the ships would be operating within

[126] Interview with Commander Mitchell, 2 November 2010. Contemporary cost estimates suggest the F-35B will cost in excess of £1 billion more through-life than the F-35C. Navy Command Carrier Strike Briefing.
[127] 'Joint Combat Aircraft', *Navy Matters*, http://navy-matters.beedall.com/jca1-2.htm. Accessed 11 September 2013.
[128] National Audit Office, *Carrier Strike*, Session 2010-2012, HC 1092 (London: The Stationery Office, 2011), p. 26, para 2.20.
[129] Meadows, 'To Sea or Not to Sea', p.99.
[130] MASC was superseded by Project Crowsnest [sic], which will be a Merlin helicopter-based replacement for the current Sea King Mk 7 Airborne Surveillance and Control System. HCDC, *Future Maritime Surveillance*, Fifth Report of Session 2012-13, HC 110 [incorporating HC 1918-i] (London: The Stationery Office, 2012), p. 31.

range of land-based assets (this also reflected the RAF perspective concerning the employment of the aircraft carriers).[131]

Lieutenant M. S. Russell, Royal Navy, writing in *The Naval Review*, argues with regard to the latter point that: 'Operational analysis shows that existing UK theatre strategic and UK/coalition maritime air surveillance assets would not be able to provide coverage for the UK Carrier Task Group...'[132] Further, since 1945, experience has indicated that airbases have not been as widely, immediately and freely available as advocates of land-based airpower have argued,[133] thus emphasising the need for a sufficient organic MASC capability. This can arguably be fulfilled by a rotary wing solution; the Sea King Mk 7 Airborne Surveillance and Control System was deemed 'good enough' and maritime AEW is tactically focused in contrast to the strategic capability provide by the land-based E-3 AWACS (Airborne Warning and Control System).[134] Moreover, a distributed approach to battlespace surveillance and early warning could be adopted utilising the F-35 alongside a heli-borne AEW system and the Type 45 *Daring*-class anti-air warfare destroyers (this approach would benefit from the adoption of Cooperative Engagement Capability).[135]

The decision to pursue the STOVL solution for CVF limits the extent to which Britain can develop interoperability with the US and French navies,[136] as well as development of a single cross-domain capable unmanned air system (UAS) and/or unmanned combat air system (UCAS) capability contributing to the manned / unmanned mix of future combat air capabilities.[137] It also prevented Britain from

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[131] Interview with Vice Admiral Sir Jeremy Blackham.
[132] Lieutenant M. S. Russell, Royal Navy, 'When You're Out of AEW, You're Out of Ships; When You're Out of ASAC, You're Out of Capability', *The Naval Review*, Vol. 97, No. 4 (November 2009), pp.349-353, quotation, p.352.
[133] See Tim Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships: 1945-2010', *Corbett Paper* No. 9 (The Corbett Centre for Maritime Policy Studies, March 2012).
[134] Interview with Admiral Sir Nigel Essenhigh.
[135] Ibid. CEC provides a 'real-time sensor netting system that enables high quality situational awareness and integrated fire control capability. CEC is designed to enhance the Anti-Air Warfare (AAW) capability of ships and aircraft by the netting of battle force sensors to provide a single, distributed AAW defense capability.' 'CEC – Cooperative Engagement Capability', United States Navy Fact File, http://www.navy.mil/navydata/fact_display.asp?cid=2100&tid=325&ct=2. For an overview of a networked intelligence, surveillance and reconnaissance approach utilising 'scan-cue-focus', see MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, July 2013), p.3-8, para 314.
[136] South, 'The Failings of Britain's Future Carrier Strike Programme', p.327.
[137] I am grateful to Commander Mitchell for this insight.

exploiting a comparative advantage it possessed in the development of electromagnetic catapult technology. Britain was a major supplier of linear induction motor technology (the technology underpinning the electromagnetic aircraft launch system) and possessed the lead in developing electromagnetic catapults.[138] The company, Force Engineering Ltd, had developed advanced linear induction motors, which it provided for the EMCAT (Electro-Magnetic CATapult) programme; an MoD effort in partnership with Converteam Ltd,[139] to develop an electromagnetic catapult system for CVF prior to the selection of the STOVL variant of the F-35.[140] The EMCAT system would arguably constitute a technically better system than the electromagnetic aircraft launch system and be more affordable.[141] Lieutenant Commander Loring, Royal Navy, citing figures supplied by Converteam, suggests a full-size EMCAT shore test facility would cost approximately £30 million; the cost of installing the system on CVF is not provided although whole life costs for both CVF vessels equipped with EMCAT are given as £284 million (over a 30 year ship life);[142] Lieutenant Commander Jeremy Tyler, Royal Navy, writing in the *Naval Review* suggests that the cost of fitting a catapult system to both carriers would have been approximately £150 million.[143] CVF designs incorporating two or three catapults (either steam or electromagnetic) were developed; however, the winning CVF design ('Alpha') from which the adaptable 'Delta' configuration was developed, would in a CATOBAR configuration, be equipped with two catapults.[144] This points to a requirement for four catapults in total, and based on the projected cost of an EMCAT shore facility costing £30 million, the figure of £150 million for four catapults (£37.5 million per catapult; an increase in 25 per cent over the shore-based system) would appear plausible. If taken together with the above-noted cost difference between the F-35 variants ($300 million more for the carrier version), the additional cost of developing CVF as CATOBAR-equipped carriers would likely have been in the region of £350 million. It warrants highlighting that the

[138] Interview with Rear Admiral Cunningham, 16 May 2012.
[139] Converteam is now owned by the US company General Electric.
[140] Loring, 'An Electro-Magnetic Catapult for the Future Carrier?' pp.154-155.
[141] Ibid.
[142] Ibid.
[143] Tyler, 'What Lessons can the United Kingdom Learn from the French Aircraft Carrier *Charles de Gaulle*?' p. 218.
[144] 'CVF Design Evolution Described at RINA Conference'.

above costs are based on the premise of the ships being built to a CATOBAR configuration and not the retrofitting of a catapult system.

The decision to opt for the STOVL variant of the F-35 and configure CVF for STOVL operations can perhaps be summarised as an example of 'the deflection of strategy by politics'. In this regard, the National Audit Office (NAO) states:

> In 2002, the Department [MoD] selected the STOVL variant of the Joint Strike Fighter... as its preferred aircraft...The Department's quantitative analysis consistently showed that the carrier variant...was more capable and cheaper to support throughout its operational life. The decision to select STOVL took into account a number of wider political, military and industrial factors.[145]

This quotation prompts the question: why, if the carrier variant of the F-35 was assessed to be clearly the better option both in terms of military utility and cost, was the STOVL variant selected instead? The variant decision was informed by the need to protect Rolls-Royce and the lobbying of the RAF,[146] with the Navy Board advising on ship issues, and the RAF providing aviation advice.[147] There was also, arguably, a cultural approach to the variant debate, that is, a significant proportion of the Harrier community were predisposed toward the STOVL variant whereas those from the Tornado community looked to the conventional F-35A or C.[148] Further, the RAF were qualitatively better-placed in the debate, being much better connected industrially and in Parliament and more adept at marshalling stakeholders for lobbying.[149] However, as highlighted by the NAO, all studies undertaken by the MoD showed the F-35C to be the better option and accepting the F-35B meant a restriction in capability.[150] Most significantly, the decision to acquire the F-35B was *not* the recommended military option: the variant decision was a political one and not military.[151]

The implication for the carrier programme was that the ships would be designed in order 'to be easily reconfigured for CV operations later in the ship's life';[152] in practice, this resulted in, by 2006/07 (that is, the advanced stage of ship design),

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[145] National Audit Office, *Carrier Strike*, p.7, para 9.
[146] Interview with former senior MoD civil servant.
[147] Interview with Admiral Sir Jonathon Band.
[148] Interview with Air Vice-Marshal Michael Harwood CB CBE, London, 22 May 2014.
[149] Interview with former senior MoD civil servant.
[150] Interview with Admiral Sir Nigel Essenhigh.
[151] Ibid.
[152] 'CVF Design Evolution Described at RINA Conference'.

CVF effectively having a CATOBAR deck but with a ski jump for STOVL operations.[153]

The 2010 SDSR Variant Decision

The wider political-military debate concerning the carrier programme in the SDSR will be discussed in detail in chapter six; the purpose of this section is to consider narrowly the decision to switch from a STOVL to CATOBAR configuration for the *Queen Elizabeth*-class aircraft carriers and JCA. Between the original 2002 STOVL variant selection and 2008, the MoD on three occasions revisited its decision, in particular due to concerns over the F-35B's weight, propulsion system and bring-back performance, albeit deciding on each occasion to proceed with the STOVL option.[154] However, the 2010 SDSR did announce the change from a STOVL to CATOBAR configuration for Britain's future Carrier Strike capability. The government explained the rationale for this decision, taken two-thirds of the way through the SDSR process,[155] in the following terms:

> As currently designed, the Queen Elizabeth will not be fully interoperable with key allies, since their naval jets could not land on it. Pursuit of closer partnership is a core strategic principle for the Strategic Defence and Security Review because it is clear that the UK will in most circumstances act militarily as part of a wider coalition. We will therefore install catapult and arrestor gear. This will delay the in-service date of the new carrier from 2016 to around 2020. But it will allow greater interoperability with US and French carriers and naval jets.... Installing the catapult and arrestor will allow the UK to acquire the carrier-variant of Joint Strike Fighter ready to deploy on the converted carrier instead of the short take-off and vertical landing (STOVL) variant. This version of the jet has a longer range and greater payload: this, not large numbers of aircraft, is the critical requirement for precision strike operations in the future. The UK plans to operate a single model of JSF, instead of different land and naval variants. Overall, the carrier-variant of the JSF will be cheaper, reducing through-life costs by around 25%.[156]

It warrants mention that the RAF was also reportedly advocating the switch from the F-35B to the F-35C. Tim Ripley, writing in *Jane's Defence Weekly*, suggested ahead of the publication of the SDSR that:

> It appears that the RAF is now backing moves to purchase the F-35C variant, which is optimised for conventional 'catapult and trap' carrier operation, unlike the short take-off and vertical-landing (STOVL) F-35B variant. "The F-35C has more

[153] Interview with Captain Dickie Payne, Royal Navy, (then) Deputy Assistant Chief of Staff Carrier Strike, London, 27 January 2011.
[154] Scott, 'Seeking the Third Way', p.14.
[155] Interview with retired senior military officer, London, 5 June 2014.
[156] HM Government, *SDSR*, p.23.

> capability, range and payload than the 'B'," said a senior RAF planner. "We envisage the vast majority of JSF missions operating from land most of the time. Only if we go floating on a carrier do you need to go STOVL. You pay a price for that, so by going 'C' you can carry more weapons and fuel."[157]

The comments attributed to the 'senior RAF planner' in the above quotation are also noteworthy in highlighting the RAF's perspective on the utility of carrier-based aviation; this will be discussed in more detail in the next chapter.

The shift to a CATOBAR configuration for the *Queen Elizabeth*-class – as CVF had been named – would require the fitting of steam catapults or an electromagnetic catapult system – the latter either the EMCAT system or the US General Atomics' electromagnetic aircraft launch system (EMALS). In order to promote interoperability with the US Navy,[158] the UK was pursuing the integration of EMALS (and the associated advanced arresting gear) with the *Queen Elizabeth*-class; a potential foreign military sales contract (worth an estimated $200 million) was disclosed in November 2011.[159] The estimated aggregated procurement cost of the CATOBAR equipment per ship was £12 million per year through life whilst annual running costs were projected to be £34 million.[160] Moreover, by this time – 2011/12 – the F-35 programme had evolved in such a manner that the F-35C carrier variant, in addition to having lower through-life costs, had a lower unit cost than the F-35B. As of 2014, the F-35 variants are estimated to cost (based on the Low-Rate Initial Production – LRIP - lot 7 production run) A, $112 million, B, $139 million and C, $130 million respectively.[161]The F-35B engine alone is projected to cost $26.2 million dollars compared to $10.8 million for that of the F-35C.[162]

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[157] Tim Ripley, 'RAF pushes JSF Cause in SDSR debate', *Jane's Defence Weekly*, Vol.47, No.40 (6 October 2010), p.7.
[158] The selection of EMALS would also avoid having to separately certify aircraft for compatibility with EMCAT, that is, as the principal EMALS user, the US Navy would be responsible for aircraft certification and clearance.
[159] 'UK to purchase EMALS sub-assemblies from US', 18 November 2011, http://www.naval-technology.com/news/newsuk-to-purchase-emals-sub-assemblies-from-us. Accessed 8 September 2013.
[160] Navy Command Carrier Strike briefing.
[161] Jon Hemmerdinger, 'FARNBOROUGH: Lockheed Remains Confident In F-35 Ahead Of International Debut', *Flight Global*, 27 June 2014, http://www.flightglobal.com/news/articles/farnborough-lockheed-remains-confident-in-f-35-ahead-of-international-400065/. Accessed 22 July 2014.
[162] United States Department of Defense, 'F-35 Selected Acquisition Report As of December 31, 2012'.

The implications for the carrier programme of the SDSR decision to switch to a CATOBAR configuration were principally that the first-of-class *Queen Elizabeth* would be completed without the CATOBAR equipment installed and used for sea trials, after which the ship would be placed in extended readiness whilst the second-of-class, *Prince of Wales* would be built to a CATOBAR configuration and enter service in 2020.[163] This was thus the position the carrier programme had reached 11 months after the SDSR; the next projected milestone was the completion of an 18-month Conversion Development Phase in December 2012.[164] However, in May 2012, the government again changed course with regard to the configuration of the *Queen Elizabeth*-class.

The May 2012 Variant Decision

In May 2012, the government announced its decision to revert to a STOVL configuration for the *Queen Elizabeth*-class and acquire the F-35B.[165] This decision was justified on the basis of a significant increase in the cost of the CATOBAR conversion - stated to be in the region of £2 billion for HMS *Prince of Wales* and substantially more for HMS *Queen Elizabeth* (whilst noting that each ship is projected to cost approximately £2.5 billion[166]) and an earlier in-service date for the F-35B.[167] It was also argued that the variant switch constituted a more affordable approach to Carrier Strike, notwithstanding the lower payload, range, persistence and greater technical risk of the F-35B, and may enable both ships to become operational.[168] This was in contrast to the SDSR statement that one carrier

[163] Interview with retired senior military officer; HM Government, *SDSR*, p.23 (p.20 provides a definition of 'extended readiness'); and Peter Felstead, 'UK Carrier to Get Second EMALS', *Jane's Defence Weekly*, Vol.48, No.37 (14 September 2011), p. 8.
[164] National Audit Office, *Carrier Strike: The 2012 Reversion Decision*, HC 63, Session 2013-14 (London: The Stationery Office, 2013), p.10, para 1.1.
[165] For discussion of the implications of this decision, see James Bosbotinis, 'The Future of UK Carrier Strike: The Strategic Implications of the F-35 Variant Decision', *RUSI Journal*, Vol.157, No.6 (December 2012), pp. 10-17, and 'The F-35 Decision: Disastrous Implications for UK Airpower', Defence IQ, 9 July 2012, http://www.defenceiq.com/air-forces-and-military-aircraft/articles/the-f-35-decision-disastrous-implications-for-uk-a/#.UUNRQxdIg0E (accessed 8 September 2013); Rear Admiral Chris Parry, 'The United Kingdom's Future Aircraft Carriers: What Are They Good For?', *RUSI Journal*, Vol.157, No.6 (December 2012) pp.4-9.
[166] National Audit Office, 'Ministry of Defence: The Major Projects Report 2011', Session 2010-2012, HC1520-1 (London: The Stationery Office, 2011), p.11.
[167] Ministry of Defence, 'Oral Statement on Carrier Strike Capability - Defence Secretary 10 May 2012', https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/27397/oral_statement_on_carrier_strike_capability.pdf. Accessed 8 September 2013.
[168] Ibid.

would be kept operational whilst the other ship was maintained at extended readiness.

Although space was provided for in the hull of the *Queen Elizabeth*-class for the installation of steam catapults or EMALS, funding for work on maintaining the adaptability of the CVF design stopped.[169] This meant that the cost of the redesign work following the SDSR decision was quite considerable and the scale of effort required to fit CATOBAR equipment much greater than anticipated.[170] In particular, it was found that the installation of catapults would be more invasive in the hull than previously thought; interestingly, the installation of arrestor gear would be considerably less invasive and complex than that required for catapults.[171] This means that, in the long run, it may be easier to convert the carriers to a STOBAR rather than CATOBAR configuration, if a STOVL successor to the F-35B is not available.[172] The FAA lobbied heavily to keep the CATOBAR approach, however the priority for the Royal Navy was to maintain the capability to deliver fixed-wing aviation from the sea.[173] Significantly, the reversion decision took political heat out of the carrier programme.[174] As will be discussed in chapter six, the programme was subject to intense debate in the SDSR and narrowly avoided cancellation; in this respect, the reversion decision may have eased tensions around the carriers.

The UK at the time of writing has a requirement for 48 F-35Bs to fulfil the Carrier Strike role.[175] At an approximate unit cost of $139 million, those aircraft will cost approximately $6.672 billion (£3.936 billion); in contrast, the same number of F-35Cs (costing $130 million) would cost $6.240 billion (£3.68 billion).[176] The RAF is considering the potential acquisition of the F-35A to replace in the long term,

[169] Interview with Admiral Sir Nigel Essenhigh.
[170] Ibid.
[171] Ibid.
[172] Ibid.
[173] Interview with retired senior military officer.
[174] Interview with Admiral Sir Jonathon Band.
[175] HCDC, *Ministry of Defence Annual Report and Accounts 2011-12*, Ninth Report of Session 2012-13, HC 828 (London: The Stationery Office, 2013), p.31.
[176] Cost projections are based on the figures from the LRIP lot 7 production batch. The cost of the F-35 is likely to fluctuate significantly as the programme approaches full-rate production; there remains the potential for technical failures (in particular relating to the F-35B) to significantly impinge on cost. In addition, the impact of sequestration in the US may result in a major change to the F-35 programme (for example, aircraft numbers could be significantly reduced) with a concomitant impact on cost.

the Typhoon (the RAF intends to operate a force of 107 Typhoons until the 2030s[177]).[178] The DPOC requirement has also been deferred until the Typhoon is replaced in the 2030s.[179] This will constitute a significant capability gap and could be interpreted as a defeat for the RAF in light of the efforts it expended to protect the FOAS programme. Conversely, it may be the case that the DPOC requirement has been folded in to the UK's nascent Future Combat Air System programme, which is intended to:

> inform the forthcoming SDSR on the most appropriate force mix of platforms and systems in order to meet the future combat air requirement from 2030. A UCAV along the lines of Taranis is one potential element of this force mix, along with an additional buy of Lightning II, a Typhoon life extension or an alternative new-build manned aircraft.[180]

The course of the DPOC requirement also highlights, as will be discussed in chapter six, the problem of short-termism and the lack of 'joined-up' thinking in British defence policy, as the National Audit Office summarise: 'Having changed its position on DPOC three times in two years, the Department must now introduce a degree of consistency in its decision-making not previously apparent in the programme….'[181]

The decision to pursue the F-35B may also mean the UK is foreclosing potential future opportunities for cooperation (military and industrial) with the US in programmes that are currently being formulated, most notably the F/A-XX,[182] unmanned air systems such as the X-47B and unmanned carrier launched airborne surveillance and strike system[183] and follow-on sixth generation systems.[184] In this

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[177] RAF, 'Typhoon FGR4', http://www.raf.mod.uk/equipment/typhooneurofighter.cfm. Accessed 8 September 2013.
[178] Robert Hewson, 'UK Slashes F-35B Numbers But Might Look to Split Buy with F-35As', *Jane's Defence Weekly*, Vol.49, No.31 (1 August 2012), p.6.
[179] NAO, *Carrier Strike: The 2012 Reversion Decision*, p.20, para 2.9.
[180] House of Commons Defence Committee, 'Remote Control: Remotely Piloted Air Systems – current and future UK use: Government Response to the Committee's Tenth Report of Session 2013–14', Sixth Special Report of Session 2014–15, HC 611 (London: The Stationery Office, 2014), p.9.
[181] Ibid.
[182] Dave Majumdar, 'US Navy Issues F/A-XX RfI', *Flight International*, 17 April 2012, http://www.flightglobal.com/news/articles/us-navy-issues-fa-xx-rfi-370806/. Accessed 8 September 2013.
[183] Northrop Grumman, 'X-47B UCAS', http://www.northropgrumman.com/Capabilities/X47BUCAS/Pages/default.aspx (accessed 12 September 2013); and United States Navy, *Naval Aviation Vision*, January 2012, http://www.public.navy.mil/airfor/nae/Vision%20Book/Naval_Aviation_Vision.pdf, pp.33-34.
[184] Navy Command Carrier Strike Briefing.

respect, it may result in the ships still needing to be fitted with CATOBAR equipment at some time during their service lives. Conversely, by opting for a STOVL approach to maritime aviation, Britain could perhaps, as it did in the 1980s and 1990s, work with the US Marine Corps to develop a follow-on STOVL air system due to their common interest in this area.[185]

The active lobbying of the USMC in support of the UK opting for the F-35B has been discussed in this chapter. It warrants adding that the 2010 SDSR variant decision caused much consternation on the part of the USMC, in part due to the potential jeopardy the British policy switch created for the STOVL programme: the USMC is dependent on STOVL for its organic sea-based fixed-wing aviation capability. The USMC thus welcomed the subsequent 2012 variant reversal decision and has provided significant assistance to the UK, namely with regard to ensuring that Royal Navy and RAF aviators continue to fly the Harrier thereby gaining sea-based STOVL experience. The Deputy Commandant for Marine Corps Aviation, Lieutenant General Jon Davis, who served a three-year tour with No. 3 Squadron RAF flying the Harrier GR5/7 from 1988 to 1991,[186] has been instrumental in this process as was the former Commandant of the USMC, General James Amos and the Assistant Commandant, General John Paxton.[187]

Conclusion

The purpose of the preceding analysis has been to shed light on the design and development of, and associated debates concerning, the CVF programme. The analysis has identified the respective costs and benefits of both a STOVL and CATOBAR configuration for an aircraft carrier, and would suggest that with respect to the CVF programme, a CATOBAR configuration best fitted the stated requirements both for the delivery of carrier-based aviation and in the context of wider British airpower. In strategic and operational terms, the selection of a

[185] See Bill Sweetman, *Joint Strike Fighter: Boeing X-32 vs Lockheed Martin X-35* (Osceola, Wisconsin: MBI Publishing, 1999), especially pp.24-37 for an overview of Anglo-US cooperation in STOVL aircraft development.
[186] 'Lieutenant General Jon Davis, Deputy Commandant for Aviation', http://www.aviation.marines.mil/Leaders/tabid/490/Article/165481/lieutenant-general-jon-m-davis.aspx. Accessed 29 July 2014.
[187] The above paragraph draws on the insight of Air Vice-Marshal Harwood. From 2008 to 2012, Air Vice-Marshal Harwood was the Head of the British Defence Staff and Defence Attaché in Washington DC.

CATOBAR configuration for CVF would have provided Britain with the capability envisioned in the SDR, whilst yielding a range of benefits, including economic (for example, pertaining to the exploitation of Britain's lead in electromagnetic rail technology), political (a greater sovereign power projection capability and interoperability with the US and French navies) and military (in particular relating to the broader sea-based capability conferred by CATOBAR and the opportunity to equip land and sea-based squadrons with a common aircraft – also providing further economic advantages). Moreover, the development of CVF as a CATOBAR-equipped carrier would 'future-proof' the ships, ensure the long-term viability of British carrier airpower and enable the UK, if it desired, to participate in US naval aviation programmes beyond the Joint Strike Fighter (such as advanced unmanned air systems).

The selection of the F-35B and with it, a STOVL configuration for the *Queen Elizabeth*-class, guided by the concept of CEPP, will provide the UK with a valuable maritime aviation capability (particularly suited to smaller-scale contingencies) and a significant increase in capability above that formerly provided by the Sea Harrier F/A2 and Harrier GR7/9.[188] With the benefit of hindsight, it could perhaps be argued that the UK should have sought to acquire an LHD-type vessel rather than aircraft carriers. As will be discussed in chapter five, the acquisition of an LHD to replace both the Royal Navy's *Invincible*-class aircraft carriers and amphibious assault ships (the *Fearless*-class landing platform docks and the helicopter carrier, HMS *Ocean*) could have constituted a potential alternative to the CVF programme. Most importantly, the UK will be acquiring in the *Queen Elizabeth*-class aircraft carriers, highly flexible and versatile platforms for projecting and protecting British interests and influence globally whilst remaining affordable. This is highlighted by the fact that the flight deck area of the *Queen Elizabeth*-class is 87 per cent that of a US *Nimitz*-class,[189] whilst costing approximately £3 billion per ship. In contrast, the USS *Ronald Reagan*, a *Nimitz*-class carrier, cost in total $17 billion (approximately £10 billion).[190]

[188] Rear Admiral Chris Parry, former Director General, Development, Concepts and Doctrine in the MoD, provides a valuable review of the utility of the future carriers in 'The United Kingdom's Future Aircraft Carriers: What Are They Good For?'
[189] Interview with Admiral Sir Nigel Essenhigh.
[190] Interview with retired senior MoD official.

As discussed above, the RAF, although publicly not opposed to the carrier programme (as it was in the 1960s with regard to CVA-01), has perhaps sought to restrict the level of airpower capability that Britain could generate from the sea, in order to protect its single-Service interest (most notably FOAS). This highlights a key issue discussed in chapter three, that of an underdeveloped awareness of the utility of carrier airpower at the political level. In this regard, if the utility of carrier airpower is not sufficiently understood, it will be much more difficult to discern the requirements for aggregate British airpower and thus the appropriate balance to be achieved between land and sea-based air forces. Similarly, with regard to naval forces, if the utility of carrier airpower is not sufficiently understood, the opportunity cost of developing a carrier capability may be perceived to be unjustifiably high with respect to the investment that otherwise could have been made in surface combatants, submarines or amphibious assets. In order to shed further light on the utility of carrier airpower, the alternatives require examination; in this case, the capabilities provided by a naval force structure that does not include a traditional aircraft carrier, and land-based airpower. This, along with an examination of the debate concerning the balance and requirements of future British airpower, is the subject for the next chapter.

5. The Future Aircraft Carrier Programme and British Strategy: An Examination of Potential Alternatives

Introduction

The purpose of this chapter is to consider whether the opportunity cost of investing in the Future Aircraft Carrier programme is justified by the capabilities that will be provided by the *Queen Elizabeth*-class, or whether potential alternative systems or approaches could equally or more effectively provide the capability required by British defence policy. In order to do this, the chapter first considers alternative naval systems and force structures, in particular, missile-armed surface combatant and submarine-based force structures and aviation-capable, multi-role amphibious assault vessels (providing the combined littoral manoeuvre and fast jet capability akin to that envisioned by the Carrier Enabled Power Projection – CEPP – approach – see chapter three, pages 126-127). The potential role of submarines and surface combatants operating as the core of a network-enabled, distributed fleet (as opposed to the current fleet architecture centred on aircraft carrier strike groups) forms an area of much contemporary debate, especially in the United States where, in certain quarters, questions are being asked with regard to the survivability, utility and cost-effectiveness of large-decked aircraft carriers, especially in the face of emerging high-end anti-access/area denial (A2/AD) threats.[1] The evaluation of potential naval alternatives to the aircraft carrier utilises as the benchmark for analysis, the capabilities required for the sea control and power projection missions and wider requirements of maritime strategy.[2]

Proceeding from this, the chapter examines maritime aviation within the wider context of British airpower. It examines the role and utility of land-based airpower

[1] See especially Captain Henry J. Hendrix, US Navy, 'At What Cost a Carrier?' *Disruptive Defense Papers* (Center for a New American Security, March 2013); and Robert C. Rubel, 'The Future of Aircraft Carriers', *Naval War College Review*, Vol. 64, No. 4 (Autumn 2011), pp.13-28 and 'The Navy's Changing Force Paradigm', *Naval War College*, Vol. 62, No. 2 (Spring 2009), pp.12-24.

[2] See chapter two, pages 88-92, for detailed discussion of British thinking on sea control and maritime power projection.

and critically assesses the respective contributions of sea and land-based aviation to British strategy and explores whether land-based aviation renders carrier-based airpower superfluous. The Joint Force approach that Britain has pursued since the late 1990s is also considered, both in conceptual terms and with regard to the actual experience of Joint Force Harrier; its implications for the development of maritime and wider airpower are evaluated. Finally, in order to inform a potential model for future British airpower, the balance of sea- and land-based aviation in relation to wider British strategic requirements is considered.

This chapter builds upon the analysis within the preceding two chapters that examined the rationale for, and the design, development and debate concerning the procurement of the *Queen Elizabeth*-class aircraft carriers. This chapter, through a comparative analysis of potential alternatives, seeks to shed further light on the utility of aircraft carriers relative to the other options and assess their value to British maritime and grand strategy, and to consider whether such platforms are a vital capability for Britain. It is also intended that the discussion within this chapter of the requirements of maritime strategy and British airpower will assess the wider role and utility of maritime forces to British strategy. This will form the basis for the analysis in the following chapter of the connection between maritime strategy and national policy. It warrants mention that for the purposes of the analysis in this chapter, it is assumed, as a baseline, that British national policy will remain predicated on possessing the means to project power and influence globally, albeit on a limited scale.[3]

Alternative Naval Force Structure Options

The purpose of this section is to examine potential naval alternatives to the traditionally conceived fixed-wing aircraft carrier. Can for example, missile-armed surface combatants and or submarines operating in conjunction with other naval and service (Army or Air Force) assets fulfil the same mission requirements as aircraft carriers? In short, does the aircraft carrier constitute an essential mission system for the Royal Navy to achieve the objectives set by national policy? In order to address this question, it is appropriate to briefly define the

[3] See Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The National Security Strategy*, Cm 7953 (London: The Stationery Office, 2010), p.4.

principal tasks of a navy. In this regard, Sir Julian Corbett defined the 'functions of a fleet' in the following terms: 'The function of the fleet, the object for which it was always employed, has been three-fold: firstly, to support or obstruct diplomatic effort; secondly, to protect or destroy commerce; and thirdly, to further or hinder military operations ashore.'[4] Underpinning those three tasks is the requirement to gain command of the sea, defined by Corbett as 'the control of maritime communications, whether for commercial or military purposes'.[5] As discussed in chapter two, the concept of sea control has superseded that of command of the sea; the functions of the fleet, to use contemporary terminology would thus be defined as international engagement (function one),[6] sea control (function two) and power projection (function three).[7]

The inherent multi-role capability of an aircraft carrier, enabled by its embarked fixed and rotary wing assets, allows the carrier to make a significant contribution to all three aforementioned naval functions. The British *Invincible*-class anti-submarine aircraft carriers, although designed principally for rotary-wing anti-submarine warfare (ASW) operations, were capable of conducting, with their embarked Sea Harrier fast jets and or Sea King helicopters, the following major tasks: anti-air warfare (AAW); anti-surface warfare (ASuW – i.e. anti-shipping operations); air-to-ground operations (land attack); littoral manoeuvre (i.e. amphibious operations); ASW; and intelligence, surveillance, target acquisition and reconnaissance (ISTAR). This is in addition to the non-combat roles an aircraft carrier can fulfil, in particular providing forward presence, deterrence and reassurance in support of wider state policy. However, a suitably configured multi-mission surface combatant, such as the US Navy's *Arleigh Burke*-class destroyer, can also conduct AAW (and ballistic missile defence – BMD)[8], ASW

[4] Julian Corbett, *England in the Seven Years' War: A Study in Combined Strategy*, Volume 1 (Cambridge: Cambridge University Press, 2010) [reprint of the original Longmans, Green, and Co. 1907 edition], p.6.
[5] Sir Julian Corbett, *Some Principles of Maritime Strategy* (reprinted with 'Introduction' by Eric Grove (Annapolis, MD: Naval Institute Press, 1988)), p.94.
[6] For an overview of the tasks encompassed under the heading, 'international engagement', see MoD/DCDC, *British Maritime Doctrine* (Joint Doctrine Publication 0-10, August 2011), pp.2-21 to 2-28.
[7] For an overview of current British doctrine regarding the roles governing the employment of maritime power, see Ibid, pp.2-7 to 2-28.
[8] An aircraft carrier cannot, at present, directly contribute to this role; its embarked fixed wing aircraft can however conduct operations against an adversary's ballistic missile forces and support infrastructure. In the mid-to-long term, carrier-based air vehicles (especially unmanned systems)

(via ship-launched missiles and two embarked helicopters), ASuW and land attack, utilising mission-appropriate missile systems (such as Standard Missile 2 and 3 surface-to-air missiles, the Harpoon anti-ship missile and Tomahawk land-attack cruise missile)[9] and the ship's main gun.[10] A surface combatant can also undertake the wider strategic roles of providing forward presence, conducting port visits and contribute to the maintaining of good order at sea/maritime security, for example, by participating in counter-piracy or counter-narcotics operations.[11] Moreover, due to the proliferation of advanced anti-ship cruise missiles, in particular, the Russian 'Club-M/K'[12] and 'Yakhont' systems,[13] and Chinese-made systems such as the C-700 and C-800 series,[14] the ability of large warships, including aircraft carriers to operate effectively, has been questioned. Professor Robert Rubel, Dean of Warfare Studies at the US Naval War College, has stated in this regard:

> The increasing effectiveness of antiship [sic] missiles, along with the increasing lethality of antiaircraft defenses [sic], is about to make necessary a shift from a force centred on "big deck" aviation platforms to one that is more distributed and oriented around missile-firing platforms – most prominently, submarines and surface combatants.[15]

Rubel has further highlighted the threat posed by the development by China of the DF-21D anti-ship ballistic missile, and the development and deployment by Russia and China of advanced integrated air defence systems and fighter aircraft

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may be able to intercept ballistic missiles utilising direct-energy weapons or advanced missile systems such as the network centric airborne defense element (NCADE). For an overview of the NCADE system, see Raytheon, 'NCADE', http://www.raytheon.com/capabilities/products/ncade/. Accessed 8 September 2013.

[9] For an overview of the Tomahawk, see '*Tomahawk* Cruise Missile' United States Navy Fact File, http://www.navy.mil/navydata/fact_display.asp?cid=2200&tid=1300&ct=2. Accessed 8 September 2013.

[10] 'Destroyers – DDG', United States Navy Fact File, http://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=900&ct=4. Accessed 8 September 2013.

[11] For an overview of the requirements of maintaining good order at sea, see Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Second Edition (Abingdon: Routledge, 2009), pp. 286-321.

[12] Concern Morinformsystem-Agat [sic], 'Club-M Coastal Missile System', http://www.concern-agat.com/products/defense-products/81-concern-agat/76-club-m and 'Club-K Container Missile System', http://www.concern-agat.com/products/defense-products/81-concern-agat/189-club-k. Accessed 8 September 2013.

[13] NPO Mashinostroyenia, 'Missile Complexes with Yakhont ASM', http://www.npomash.ru/activities/en/yakhont.htm. Accessed 8 September 2013.

[14] For an overview of Chinese domestic and international anti-ship missile programmes, see Robert Hewson, 'Dragon's Teeth – Chinese Missiles Raise Their Game', *Jane's Navy International*, Vol. 112, No.1 (January/February 2007), pp.19-23.

[15] Robert C. Rubel, 'The Navy's Changing Force Paradigm', *Naval War College*, Vol.62, No.2 (Spring 2009), pp.12-24, quotation, p.14.

(most notably, derivatives of the Sukhoi Su-27 'Flanker') that together, pose a significant threat both to the carrier itself and the survivability and mission effectiveness of the embarked air-group.[16] This reflects a wider argument that aircraft carriers should, in the face of high-end A2/AD threats, be reserved for non-high intensity warfare and that major war-fighting should be undertaken by dispersed, small stealthy combatants.[17] Such a force would be designed particularly to counter access denial threats and operate persistently within the littoral, whilst also being more resilient to attrition.[18] The US Navy's Chief of Naval Operation's Strategic Studies Group, based at the US Naval War College, examined the requirements of operating in the littoral in the late 1990s, and as described by Long and Johnson: 'argued for two attributes for the future fleet and its platforms that became central to the small ship debate: distributed combat power, to include a greater number of networked combat ships, the use of unmanned vehicles (UVs) and offboard [sic] sensors, and modularity to provide mission flexibility'.[19] The Strategic Studies Group, although examining future fleet requirements for the US Navy, identified an issue that is also of critical contemporary importance to the Royal Navy:

> Combat power in the current Navy was tied to particular hulls. The battle force ships were capable of carrying out a variety of missions. For example, the Navy's main destroyer type, the DDG-51 *Arleigh Burke* class had the capacity to conduct ASW, fleet air defense, land attack, mine warfare (MIW), and other missions. All this combat power would be lost if the fleet lost that one ship.[20]

In the case of the Royal Navy, the loss of one Type 45 *Daring*-class destroyer[21] would be even more significant; such a loss out of a force of only six *Daring*-class ships would represent 16.6 per cent of Britain's total destroyer strength and principal naval AAW asset (the *Daring*-class are optimised for the AAW role and

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[16] Robert C. Rubel, 'The Future of Aircraft Carriers', *Naval War College Review*, Vol. 64, No. 4 (Autumn 2011), pp.13-28.
[17] This is an alternate school of thought to the Air Sea Battle concept, which also seeks to meet the challenge posed by high-end A2/AD threats but retains the aircraft carrier as a core asset of a mixed, balanced force. Interview with Professor Geoffrey Till, Shrivenham, 9 June 2011.
[18] Duncan Long and Stuart Johnson, 'The Littoral Combat Ship: From Concept to Program', *Case Studies in Defense Transformation Number 7* (Center for Technology and National Security Policy, National Defense University, 2007), p.4. For a British perspective, see MoD/DCDC, 'Future "Black Swan" Class Sloop-of-War: A Group System' (Joint Concept Note 1/12, May 2012).
[19] Ibid., pp.2-3.
[20] Ibid., p.3.
[21] 'Type 45 Daring Class Destroyer, United Kingdom', http://www.naval-technology.com/projects/horizon/. Accessed 8 September 2013.

do not have the same level of multi-role capability of the *Arleigh Burke*-class)[22]. The response advocated by the Strategic Studies Group is summarised by Long and Johnson:

> The SSG argued that distributing this combat power on UVs, such as unmanned aerial vehicles (UAVs) to deliver strikes ashore and unmanned undersea vehicles (UUVs) to hunt for mines and submarines, would make the fleet's combat power more survivable…Further, distributed, unmanned sensors would allow the fleet to develop more robust battlespace knowledge than would sensors limited to the area around a single hull.[23]

However, the approach advocated by the Strategic Studies Group did not seek to *replace* the aircraft carrier and other large warships; rather, the force based on distributed, networked assets would: 'counter access denial threats in the littorals. Distributing combat power among more platforms would make the fleet more tactically stable and lessen the need to expose… [aircraft carriers and other major surface combatants]… and the large amount of combat power they contain to littoral dangers'.[24]

Rubel and Captain Henry Hendrix, US Navy, also emphasise the increasing importance of unmanned combat air vehicles (UCAVs) and suggest a shift in focus for naval aviation toward UCAVs and other unmanned air systems.[25] Moreover, Hendrix has advocated the development of UCAVs that would be capable of operating from the US Navy's amphibious assault carriers, in particular the new *America*-class.[26] This would require the UCAV to be designed for short take-off and vertical landing operations and a shift in employment of the amphibious assault vessels from one focused on littoral manoeuvre to one akin to the CEPP approach under development for the forthcoming British *Queen Elizabeth*-class. This will be discussed in greater detail below. The approach to maritime operations suggested by Rubel and Hendrix calls for a shift away from

[22] The US Arleigh Burke-class AEGIS destroyer was considered as an option for the Type 45, following Britain's withdrawal from the pan-European Horizon programme, but discarded on cost grounds. House of Commons Defence Committee (HCDC), *Major Procurement Projects Survey: The Common New Generation Frigate Programme*, Eighth Report of Session 1998-99, HC 544 (London: The Stationery Office, 1999), para 28.
[23] Long and Johnson, p.3.
[24] Ibid., p.4.
[25] Captain Henry J. Hendrix, US Navy, 'At What Cost a Carrier?' *Disruptive Defense Papers* (Center for a New American Security, March 2013), pp. 9-10 and Rubel, "The Future of Aircraft Carriers', p.21, 22 and 24.
[26] Hendrix, 'Twilight of the $UPERflous [sic] Carrier', *Proceedings*, Vol. 137/5/1, 299 (May 2011). For an overview of the *America*-class, see 'America Class Amphibious Assault Ship, United States of America', http://www.naval-technology.com/projects/americaclassamphibio/.

the large deck aircraft carrier as the 'supreme arbiter of naval power and the determinant of fleet architecture'.[27] Such an approach would find support in some quarters in Britain, where doubts have been raised as to the wisdom of having invested in the future aircraft carrier programme whilst seeing the number of surface combatants in Royal Navy service decline markedly.[28] In this regard, the 1998 Strategic Defence Review established a total force of 32 destroyers and frigates – down from 35;[29] the 2010 Strategic Defence and Security Review reduced the size of the destroyer and frigate force from 23 to 19 ships.[30] Thus, between 1998 and 2010/11, the Royal Navy's force of surface combatants was effectively halved, in major part to fund operations in Iraq and Afghanistan without increasing the defence budget.

In order to examine whether Britain should, as an alternative to the *Queen Elizabeth*-class aircraft carriers, have sought instead to develop a fleet centred on missile-armed surface combatants and submarines, a brief discussion of the principal generic platform and weapon system options of potential utility to such an approach is required. Subsequent to this, the utility of a missile-centric force will be evaluated.

Major Surface Combatants

The development of multi-role surface combatants equipped with advanced radar systems such as the US-developed AEGIS and vertical launch systems (VLS) enabling a significant increase in the missile armament of a warship for a given displacement, has prompted discussion as to whether such ships could undertake the roles currently performed by aircraft carriers and their embarked air-groups.[31] Robert Work of the US Center for Strategic and Budgetary Assessments illustrates the expansion in offensive capability conferred by the shift to a VLS configuration, with reference to the US Navy's *Ticonderoga*-class cruisers:

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[27] Rubel, 'The Future of Aircraft Carriers', p.26.
[28] Interview with Vice Admiral Sir Jeremy Blackham, London, 13 February 2012.
[29] Ministry of Defence, *The Strategic Defence Review*, Cm 3999 (London: The Stationery Office, 1998), p.40.
[30] HM Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (SDSR), Cm 7948 (London: The Stationery Office, October 2010), p.22.
[31] For example, see Commander Phillip E. Pournelle, US Navy, 'Rise of the Missile Carriers', *Proceedings*, Vol. 139/5/1, 323 (May 2013).

> The first five *Ticonderoga*-class cruisers were armed with a Mk-26 twin-rail missile launching system both fore and aft, each located over a rotary magazine with a capacity of 44 missiles. The next 22 VLS-equipped *Ticonderogas* carried 64 missile cells forward and 64 missile cells aft (although six cells were used for missile storage). Switching to the VLS system thus allowed the newer cruisers – with hulls identical to those of the earlier ships – to increase their total magazine capacity from 88 to 122 missiles. In other words, VLS allowed for a 38 percent [sic] increase in comparable ship magazine loads.[32]

Moreover, the installation of a VLS allows a more flexible approach to a ship's armament, thus enhancing multi-role capability, as highlighted by Work:

> A single VLS cell is a rectangular box with an opening on one end measuring 25x25 inches. These cells come in three different lengths, and they can be configured to carry either four short-range self-defense [sic] missiles in a special "quad pack" arrangement; one surface-to-air (SAM) missile; one anti-submarine rocket (ASROC) or a single Tomahawk land attack cruise missile.[33]

A further benefit of a VLS is its modularity. The Lockheed Martin Mk 41 VLS, the system employed by the US Navy, is built upon a basic eight-cell module and thus can be scaled to provide a level of capability appropriate to the host ship. For example, it could range from an eight-cell module on an offshore patrol vessel to provide a self-defence capability, through to a 122-cell fit on a cruiser (such as the *Ticonderoga*-class) providing the full spectrum of AAW, BMD, ASW, ASuW and land attack capabilities.[34] The use of a VLS also enhances the long-term growth potential of a ship. The British Type 45 *Daring*-class are currently fitted with a 48-cell VLS equipped with the Sea Viper air defence system; space has been reserved within the hull to enable the later installation of 'strike-length' VLS cells (in order to enable the ship to be armed with the Tomahawk, or similar,[35] land attack cruise missile).[36]

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[32] Robert O. Work, 'Naval Transformation and the Littoral Combat Ship' (Center for Strategic and Budgetary Assessments, February 2004), p.16

[33] Ibid., pp.16-17.

[34] Lockheed Martin, 'MK 41 Vertical Launching System (VLS)', http://www.lockheedmartin.com/content/dam/lockheed/data/ms2/documents/launchers/MK41_VLS_factsheet.pdf. Accessed 8 September 2013.

[35] The MBDA *Missile de Croisière Naval* (MdCN, Naval Cruise Missile), a naval derivative of the Storm Shadow air-launched cruise missile, developed for the French Navy, would also be a potential candidate for a surface-launched cruise missile for the *Daring*-class. For an overview of the MdCN, see http://www.mbda-systems.com/mediagallery/files/mdcn_background-1367919511.pdf. Accessed 8 September 2013.

[36] Nick Childs, *Britain's Future Navy* (Barnsley: Pen and Sword Maritime, 2012), p.108.

Submarines

The contemporary British submarine force (excluding the four *Vanguard*-class Trident nuclear missile-armed boats), comprising six Tomahawk cruise missile-armed SSNs (five *Trafalgar*-class and one *Astute*-class),[37] can undertake to a significant extent the roles envisaged by commentators such as Rubel and Hendrix. However, in evaluating alternatives to acquiring the *Queen Elizabeth*-class, the potential utility of a guided missile-armed nuclear submarine – an SSGN – warrants consideration. An SSGN in this context is taken to be a nuclear-powered submarine configured principally for the launching of conventionally armed missiles. The US Navy's four converted *Ohio*-class submarines are the leading example of such a platform.[38] The submarines, previously armed with 24 Trident nuclear submarine-launched intercontinental ballistic missiles were, in the early 2000s, re-equipped for the conventional strike mission. This entailed the conversion of 22 of the Trident launch tubes to each fire seven Tomahawk cruise missiles (for a total of 154 Tomahawks) and the use of the forward two Trident tubes for Special Forces support purposes.[39] The large capacity of the former SSBN provides a significant conventional strike capability – equivalent to the Tomahawk load-out of an entire US carrier group.[40] The USS *Florida*, one of the four *Ohio*-class SSGNs, undertook the first combat operations by the type during Operation *Odyssey Dawn* against Libya in 2011.[41] The US did not contribute a carrier strike group to Operation *Odyssey Dawn*, but instead utilised long-range strike assets (submarine and ship-launched cruise missiles and manned bombers),

[37] IISS, *The Military Balance 2013*, p.188.
[38] The Russian (and previously, Soviet) Navy also operate SSGNs, most notably the *Oscar-II* (Project 949A) class boats, armed with 24 SS-N-19 *Shipwreck* anti-ship missiles. The Russian Navy will also be commissioning from 2013 onward, the *Graney*-class SSGN, which will be armed with a variety of missile systems, including the 5,500 kilometre-range Kh-101 conventional land-attack cruise missile. For an overview of the Russian submarine force, see James Bosbotinis, 'The Russian Federation Navy: An Assessment of its Strategic Setting, Doctrine and Prospects', *Special Series* (Research and Assessment Branch: The Defence Academy of the United Kingdom), 10/10, September 2010, pp.19-20 and 24-26.
[39] Lee Willett, 'Astute, Trident and SSGN: Land Attack for the Royal Navy Submarine Service', *RUSI Defence Systems*, Vol. 8, No. 1 (Summer 2005), pp.103-107.
[40] Ibid., p.106.
[41] Mass Communication Specialist 1st Class (SW) James Kimber (Naval Submarine Base Kings Bay Public Affairs), 'Florida Returns from Historic Submarine Deployment', 29 April 2011, http://www.navy.mil/submit/display.asp?story_id=60079. Accessed 8 September 2013.

embarked AV-8B Harriers from an amphibious assault ship and land-based tactical aircraft as its principal combat assets.[42]

Evaluating the Missile-Centric Force

It is argued by some analysts that a missile-centric force constitutes a more effective (in combat and cost terms) capability than a carrier group. Pournelle states in this regard:

> Missile carriers are far more combat-effective and survivable than aircraft carriers because of the rapid volume of fire they can deliver, the distribution in several shooters, and the low signature relative to an aircraft carrier. The rapid pulse of power was the *raison d'être* for the carrier's rise in World War II, but we have reached the logical maximum of this capacity in the new *Gerald R. Ford* class, and it does not reach that of the vertical-launch system… The ability to deliver a massive strike rapidly means the launching platform can rush in, execute the mission, and withdraw. The carrier, on the other hand, must remain vulnerable to attack while the air wing is launched and recovered through multiple cycles.[43]

This quotation contains three points relevant to the analysis of the missile-armed submarine/surface combatant-based force structure; namely, volume of fire, combat effectiveness and survivability. The volume of offensive fire available to a surface action group consisting of perhaps six destroyers, each armed with potentially 48 cruise missiles,[44] giving a total of 288 cruise missiles, would not offer a significant increase over the strike capability of a carrier air group. The combat persistence of an aircraft carrier, is in fact, significantly greater, as highlighted by Benjamin Lambeth of the US-based RAND Corporation, in his observation (albeit with regard to large US *Nimitz*-class carriers) that 'A single carrier air wing now offers the target-coverage equivalent of 4,000–5,000 TLAMs [Tomahawk Land Attack Missile] over the course of a 30-day operation'.[45] Further, an aircraft carrier's magazines can be replenished in the course of combat operations via replenishment-at-sea, whereas as Jan Van Tol points out with regard to VLS-equipped vessels: 'Ships exhausting their magazines would be

[42] For an overview of the US contribution to initial operations over Libya, see Jeremiah Gertler, 'Operation Odyssey Dawn (Libya): Background and Issues for Congress', *CRS Report for Congress*, R41725, 28 March 2011.
[43] Pournelle, 'Rise of the Missile Carriers'. The assumption that missile carriers have a lower signature than an aircraft carrier may be true in the context of individual ships, but arguably would not be the case regarding an entire surface action group launching a large salvo of missiles.
[44] Pournelle suggests 50 per cent of an *Arleigh Burke*-class destroyer's VLS armament consists of cruise missiles, that is, 48 missiles. Pournelle, 'Rise of the Missile Carriers'.
[45] Benjamin S. Lambeth, *American Carrier Air Power at the Dawn of a New Century* (RAND Corporation, 2005), p.90 (footnote 19).

compelled to leave the theater [sic] to rearm since VLS tubes cannot currently be rearmed at sea. These ships would be out of action for weeks given the need to transit to and from rear areas, further disadvantaging the defense [sic]'.[46]

In the British context, the originally-intended 36-strong *Queen Elizabeth*-class air-group would be capable of delivering 72 1,000 lb. weapons if only utilising internal carriage; with external ordnance added – an F-35 has four external hard-points (this would be dependent on the threat environment) – a total of 216 strike munitions could be delivered *in addition* to 72 air-to-air missiles, and this effort could be delivered potentially twice a day for five consecutive days (see chapter four, page 132). This is a simplified comparison and does not take into account the most important difference between the volume of firepower available to a surface combatant force or a carrier; the aforementioned combat persistence of the carrier. Moreover, an F-35B can carry a range of internal and external ordnance, including, for example, eight 285 lb. small diameter bombs (internally), the Storm Shadow cruise missile externally (offering a counter-hardened target capability), air-to-air weapons and anti-radar missiles.

In short, a carrier is capable, via its air-group, of delivering on a sustained basis, a greater volume of more diverse firepower than a surface combatant force. In addition, the carrier-based aircraft are, whilst undertaking a strike sortie, also contributing to the establishment of air superiority at ranges beyond that of the engagement range of the surface-to-air missiles of a surface combatant,[47] and most significantly, capable of engaging the launch platforms of advanced air-launched anti-ship weapons before missile release (and undertaking counter-force operations against surface and ground-launched systems). Thus, in terms of combat effectiveness and survivability, the carrier group, effectively combining the benefits of a surface action group with the firepower and flexibility of a carrier, offers a more capable package than a surface action group. It does warrant

[46] Jan Van Tol with Mark Gunzinger, Andrew Krepinevich and Jim Thomas, *AirSea Battle: A Point of Departure Operational Concept* (CSBA, 2010), p.40.
[47] The range of the Sea Viper missile system – the air defence system installed on the Type 45 *Daring*-class – is approximately 70 miles, 'Sea Viper', http://www.royalnavy.mod.uk/The-Fleet/Ships/Weapons-Systems/Sea-Viper (accessed 8 September 2013). In contrast, an F-35B (radius of 463 nautical miles) can engage with the AIM-120, air targets at a range of approximately 20-30 miles. 'AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM), United States of America', http://www.airforce-technology.com/projects/aim-120-advanced-medium-range-air-to-air-missile-amraam/. Accessed 8 September 2013.

mention that, at present, the strike range of a Tomahawk cruise missile exceeds that of carrier-based aircraft (although air-to-air refuelling can be used to extend the range of aircraft), however, future carrier-based unmanned air systems are likely to have ranges exceeding significantly that of cruise missiles: the X-47B demonstrator, for example, has a range of 2,100 nautical miles.[48] A further advantage of carrier-based airpower with respect to land attack missiles is the former's demonstrative, non-kinetic capability; an aircraft can be used to convey intent without a weapons release. In contrast, a missile can only be used offensively. This may not be an issue in high-intensity operations but for lower intensity scenarios, such as peacekeeping, crisis response or counter-insurgency operations may be a significant constraint. An example in this regard is the use of British carrier-based aircraft over Sierra Leone, where Royal Navy Sea Harrier F/A2s and Royal Air Force (RAF) Harrier GR7s flew 'together in an extremely successful operation where the desired effect was produced by noise and the mere "presence" of air power'.[49]

The contribution of carrier-based aircraft to developing battle-space awareness cannot be overlooked, in particular as next-generation air systems, most notably the F-35 and unmanned aircraft,[50] are intended to provide advanced ISTAR capabilities whilst operating within otherwise denied airspace. In addition, if deployed on a forward presence mission, the carrier's embarked aircraft can, whilst undertaking 'routine' training flights, also be undertaking ISTAR tasks. Moreover, carrier-based fixed wing aircraft can operate at longer ranges, higher altitudes – including over the horizon – and carry a more diverse sensor package than the organic rotary wing assets of surface combatants. Certain aircraft, in particular the E-2D Advanced Hawkeye,[51] offer advanced battle management, command and control and situational awareness capabilities that would be key to

[48] Northrop Grumman, 'Unmanned Combat Air System Carrier Demonstration (UCAS-D)', http://www.northropgrumman.com/Capabilities/X47BUCAS/Documents/X-47B_Navy_UCAS_FactSheet.pdf. Accessed 8 September 2013.
[49] Commodore Bill Covington, Royal Navy, 'The Joint Force Harrier Concept', *RAF Historical Society Journal* (No.35A, 'The Harrier Story', 2006), p.100-106, quotation p.102. Cdre Covington held a number of positions, including commanding officer of 801 Naval Air Squadron, Commander (Air) on HMS *Illustrious*, Commodore Joint Force 2000 and Senior Naval Officer at HQ Strike Command.
[50] Such as the US unmanned carrier launched airborne surveillance and strike system.
[51] Northrop Grumman, 'E-2D Advanced Hawkeye', http://www.northropgrumman.com/Capabilities/E2DAdvancedHawkeye/Documents/pageDocuments/E-2D_information_booklet.pdf. Accessed 8 September 2013.

the network-centric operations envisaged by, for example, Rubel, Hendrix and Pournelle and could not be provided by an SSGN or a surface combatant-based force structure without recourse to land-based assets.

The above has focused principally on the power projection role, but it must be highlighted that the aircraft carrier has a great degree of flexibility across roles. This applies to an extent to surface combatants, and in particular niches, submarines. However, the aircraft carrier, by virtue of its ability to enable operations across environmental domains (that is, the maritime and air environments) at a larger scale than other platforms,[52] with the inherently multi-role capabilities of its embarked fixed and rotary wing aircraft can undertake roles in support of all the principal fleet functions. Moreover, the investment in alternate capabilities, such as multi-role destroyers or SSGNs, and the necessary supporting systems, especially ISTAR assets, would not yield sufficient savings to justify the loss of capability compared to that provided by a carrier. Such assets are by no means a cheap alternative.

The LHD Option

The alternative naval force structure advocated by Rubel, Hendrix and Pournelle does not dismiss the role of naval aviation, but rather suggests that instead of acquiring large-deck conventional aircraft carriers, investment should be directed toward multi-role amphibious assault carriers which provide both littoral manoeuvre and tactical fixed wing aviation capabilities (somewhat akin to the CEPP approach envisaged for the *Queen Elizabeth*-class). Hendrix, for example, suggests that rather than continue with acquiring the large *Gerald R. Ford*-class aircraft carriers, the US Navy should instead focus on the *America*-class amphibious assault ships, due to their lower cost and greater utility.[53] In addition, Hendrix argues that 'Amphibious ships are the prototypes for future surface combatants. Their design essentials make them perfect carriers of unmanned

[52] For example, a destroyer may embark perhaps two helicopters; a small helicopter carrier such as the Japanese *Hyuga*-class, in contrast, carries 11. For an overview of the *Hyuga*-class, see 'JMSDF Hyuga Class Destroyer, Japan', http://www.naval-technology.com/projects/hyuga-class/. Accessed 8 September 2013.
[53] Hendrix, 'Twilight of the $UPERflous [sic] Carrier'.

systems. Amphibious ships by design provide strong interfaces to the air, surface, and subsurface domains'.[54]

Would such a vessel constitute a viable alternative to the *Queen Elizabeth*-class? The *America*-class (45,000 ton) are an example of a large 'landing ship assault' (LHA) and are designed to operate vertical/short take-off and landing (V/STOL) fixed-wing and tilt-rotor aircraft and deploy, via air lift, a marine assault force in excess of 1,800 troops.[55] There are also the similarly configured 'landing helicopter docks' (LHD), which feature a floodable docking well to enable landing craft and hovercraft ('landing craft air cushioned') to mount amphibious assault operations. Examples of LHDs include the large US *Wasp*-class (40,000 ton), smaller French *Mistral*-class (21,000 ton) and Spanish *Juan Carlos*-class (27,000 tons). The principal difference in capability between a 20-30,000 ton and 40,000 ton vessel is the extent of aviation capabilities and troop lift capacity; the *Juan Carlos*-class, for example, can embark up to 24 fixed and rotary wing aircraft and 883 troops.[56] In contrast, the *Wasp*-class can transport a marine force of up to 1871 troops and embark typically 23 helicopters (and increasingly the tilt-rotor MV-22 Osprey) and six to eight STOVL Harriers (to be replaced by the F-35B).[57]

In the British case, the acquisition of a large LHD, comparable to the *Wasp* or *America*-classes and in line with initial thinking on the projected size of CVF (30,000-40,000 tons) would have been feasible. In cost terms, such a vessel would have been comparable to the planned unit cost of CVF, circa £1.5 billion (the first-of-class USS *America* cost $2.4 billion - £1.6 billion)[58]. An LHD would employ a STOVL configuration and thus would bring with it the limitations of STOVL aircraft discussed in chapter four (see pages 138-142). Conversely, the pursuit of

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[54] Ibid.
[55] For an overview of the *America*-class, see Grace Jean, 'Lighting Off: The America-Class Amphibious Assault Ships Take Shape', *Jane's Navy International*, Vol.118, No.6 (July/August 2013), pp.14-18.
[56] Navantia, 'Strategic Projection Ship, LHD "Juan Carlos I", http://www.navantia.es/ckfinder/userfiles/files/sala_pr/folleto%20LHD_marzo_para%20navantia_ingles.pdf. Accessed 8 September 2013.
[57] The typical air-group of a *Wasp*-class LHD consists of 12 CH-46 Sea Knight, four CH-53E Sea Stallion, four AH-1W Super Cobra and three UH-1N Huey helicopters plus six AV-8B Harriers. 'AMPHIBIOUS ASSAULT SHIPS - LHA/LHD/LHA(R)', US Navy Fact File, http://www.navy.mil/navydata/fact_display.asp?cid=4200&tid=400&ct=4. Accessed 8 September 2013.
[58] Jean, 'Lighting Off: The America-Class Amphibious Assault Ships Take Shape'.

an LHD would have offered the opportunity to focus on the development of a more integrated littoral manoeuvre capability akin to the Marine Air Ground Task Force concept employed by the United States Marine Corps (USMC).[59] Such an approach would have been in keeping with thinking in some quarters toward the future carrier programme that envisioned the ships as 'mobile bird farms' (see chapter three, pages 123-124) and would, in retrospect, have been a more suitable avenue within which to develop the CEPP approach. In addition, the acquisition of an LHD would not have precluded the development of a limited sea-based strike capability, utilising the LHD as a fixed wing aircraft carrier: USMC experience is useful in this regard.

The USMC has employed its LHDs as dedicated fixed wing aircraft carriers; the USS *Bonhomme-Richard* and *Bataan* operated in this capacity in Operation *Iraqi Freedom* in 2003 with air-groups consisting of 24 AV-8B Harriers.[60] The USMC is also developing concepts for employing the F-35B in a similar manner, with one option involving the deployment of 16 F-35Bs with six air-to-air refuelling configured MV-22 Osprey aircraft on an LHD, and a second option involving the deployment of 20 F-35Bs on an LHD in order to generate the maximum number of sorties.[61] A particular advantage of operating an LHD in this manner is that it removes the limitations imposed by operating a 'mixed deck', as Major Whalen, USMC, explains (and relevant to the approach envisaged under CEPP): 'The term "mixed deck" refers to the combination of fixed-wing and rotary-wing aircraft that a Marine composite squadron will embark aboard an LHA or LHD. Under this condition, operational and safety limitations lead to inefficiencies that are not seen on a deck solely dedicated to fixed-wing operations'.[62]

Had the UK sought to procure LHDs rather than CVF, the option of combining the carrier replacement programme with longer-term amphibious force structuring would become available. That is, the intended number of ships to be acquired

[59] For an overview of the US Marines' approach to aviation operations, see US Marine Corps, *Aviation Operations* (MCWP 3-2, 2000), p.1-1.
[60] Major J. Scott Whalen, USMC, 'V/STOL in the United States Marine Corps: The Past, Present, and Future- Why We Need the STOVL Joint Strike Fighter' (Marine Corps War College, 2005), p.10.
[61] Dave Majumdar, 'PARIS: USMC explores F-35B operating concepts', *Flight Global*, 19 June 2013, http://www.flightglobal.com/news/articles/paris-usmc-explores-f-35b-operating-concepts-387420/. Accessed 8 September 2013.
[62] Whalen, p.11.

could have been increased in order to provide a replacement for the helicopter carrier HMS *Ocean*.[63] A three-strong class of LHDs would enable two to be kept operational (as was the case with the *Invincible*-class) at any one time and would allow potentially, for a medium-scale operation, one ship to be deployed as a fixed wing carrier with the other in the littoral manoeuvre (dedicated rotary wing) capacity and thus maximise the operational effectiveness of both ships. This approach would however be vulnerable to budget cuts removing the third ship, and thus undermining the concept. The acquisition of an LHD-based maritime aviation capability would have meant that the UK was following the second of two options, as explained by 'Noah's News' (see chapter four, page 142), that is, tactically focused, expeditionary maritime offensive air operations.

In this respect, the sea-based fixed wing aviation capability available to the UK would be less than that originally envisaged for CVF (although comparable to that which will be provided under post-SDSR planning); the LHD route would have provided the UK with an enhanced littoral manoeuvre capability. In strategic terms, the reduced fixed wing capability provided by an LHD would, for medium and large-scale operations, result in the UK either needing also to deploy land-based air assets to provide the full spectrum of air capabilities or draw upon US (or French) carrier airpower. At the political level, the pursuit of an LHD may have been less contentious than the development of CVF, in particular as an LHD would necessarily have meant the Royal Navy only being interested in V/STOL operations and therefore not posing a 'threat' to the RAF, especially with regard to its deep strike role. This is in distinct contrast to the potential contribution to aggregate British airpower that a CATOBAR-configured *Queen Elizabeth*-class aircraft carrier with 36 embarked F-35Cs would have made.

The LHD option was not considered for two principal reasons. First, the government sought to acquire a strike carrier capability and not an amphibious vessel: the LHD did not provide a relevant answer to the capability question being asked by policy.[64] In this regard, the Royal Navy was in the process of recapitalising its amphibious capability, receiving the helicopter carrier HMS

[63] HMS *Ocean* was commissioned in 1998; initial thinking toward a replacement envisaged such a vessel entering service around 2018. Richard Beedall, 'Landing Platform Helicopter (Replacement) – LPH(R)', http://navy-matters.beedall.com/lphr.htm. Accessed 8 September 2013.
[64] Interview with Admiral Sir Nigel Essenhigh, Fareham, 29 May 2014.

Ocean in 1998 and had on order two replacement landing platform docks, *Albion* and *Bulwark* (commissioned in 2003 and 2004 respectively).[65] Second, and noted in the preceding point, was that the requirement for CVF defined in the SDR called for an aircraft carrier which, as discussed in chapter four (see page 132), was intended to provide the necessary weight of offensive airpower for a medium scale operation. An LHD would not have met this requirement. However, as will be discussed in the following chapter, within the context of the revised carrier policy established in the SDSR, the capabilities offered by an LHD would be more relevant.

The contribution of maritime airpower, and particularly its sea-based component, to British strategy has been an area of much debate, and since the formation of the RAF in 1918, an enduring source of tension between that service and the Royal Navy. On occasion, especially during the debate concerning whether to procure CVA-01 in the mid-1960s, the RAF argued that land-based airpower rendered carrier-based aviation unnecessary;[66] this chapter now turns to consider the merits of land-based versus sea-based airpower and their respective contribution to Britain's aggregate airpower needs.

Maritime Aviation and British Airpower

The utility of maritime aviation to wider British airpower has been questioned on a number of occasions since the amalgamation of the Royal Flying Corps and Royal Naval Air Service in 1918. Most notably, carrier aviation's development effectively stagnated in the inter-war period due in part to the impact of Royal Air Force ownership of naval aviation;[67] naval aviation was again subject to intense,

[65] Richard Beedall, 'Albion Class', http://navy-matters.beedall.com/albion.htm. Accessed 18 July 2014.

[66] For a detailed overview of this debate, see Eric Grove, *Vanguard to Trident: British Naval Policy Since World War II* (London: Bodley Head, 1987), pp. 269-277; Edward Hampshire, 'The Battle for CVA01', in Tim Benbow (ed.), *British Naval Aviation: The First 100 Years* (Farnham: Ashgate, 2011); and Gjert Lage Dyndal, *Land Based Air Power or Aircraft Carriers? A Case Study of the British Debate about Maritime Air Power in the 1960s* (Farnham: Ashgate, 2012). Also see Eric Grove, 'Partnership Spurned: the Royal Navy's Search for a Joint Maritime-Air Strategy East of Suez, 1961-63' in N.A.M. Rodger (ed.), *Naval Power in the Twentieth Century* (Basingstoke: Macmillan, 1996) for an overview of Royal Navy attempts to develop a joint air strategy with the Royal Air Force in the early 1960s, combining sea and land-based airpower.

[67] For accounts of this period, see Geoffrey Till, *Air Power and the Royal Navy 1914-1945* (London: Jane's, 1979) and Christina J. M. Goulter, *A Forgotten Offensive: Royal Air Force*

perhaps over-zealous, scrutiny during the Radical Review of the 1950s[68] and as previously mentioned, in the 1960s with regard to CVA-01. Most recently, the 2010 SDSR resulted in the loss (albeit temporary) of a sea-based fixed wing capability and significant reduction in the fixed wing component of the future *Queen Elizabeth*-class aircraft carrier(s). Moreover, the statement in the SDSR that 'In the short term, there are few circumstances we can envisage where the ability to deploy airpower from the sea will be essential',[69] points to a lack of understanding of the utility of sea-based aviation and the influence of particular interests within the decision-making process.[70] In addition, the May 2012 decision to switch to the F-35B and with it, a STOVL configuration for the *Queen Elizabeth*-class, combined with a continuing RAF interest in the land-based F-35A (which does not have the same performance/capability limitations as the STOVL variant),[71] and advocacy of an approach to sea-based operations that emphasises minimising embarked periods,[72] suggests the debate concerning the appropriate balance between land and sea-based fixed wing aviation for the UK will endure.

In order to inform discussion of what would constitute an appropriate balance of land and sea-based aviation for the UK, it is necessary to examine the advantages and disadvantages of land basing. A well-founded, main operating base can host a larger number of aircraft and generate more sorties than a carrier, including larger types such as intra and inter-theatre lift aircraft (for example, the C-130, A-400M and C-17). An example in this regard was the scale of effort sustained by 90 US Marine Corps aircraft deployed to Ahmed Al Jaber Airbase in Kuwait for Operation *Iraqi Freedom*, which significantly exceeded what could be generated

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Coastal Command's Anti-Shipping Campaign, 1940-1945 (London: Frank Cass, 1995), in particular chapters two and three.

[68] For an account of the Radical Review, see Tim Benbow, 'British Naval Aviation and the "Radical Review", 1953-55', in Benbow (ed.), *British Naval Aviation*.

[69] HM Government, *SDSR*, p.5.

[70] For discussion of the SDSR and its decisions on maritime airpower, see Tim Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships: 1945-2010', *Corbett Paper* No.9 (The Corbett Centre for Maritime Policy Studies, March 2012).

[71] For example, see Robert Hewson, 'UK Slashes F-35B Numbers But Might Look to Split Buy with F-35As', *Jane's Defence Weekly*, (Vol.49, No.31, 1 August 2012), p.6; and Tim Ripley, 'Defence of the Realm: Looking Toward the 2015 UK SDSR', *Jane's Defence Weekly* (Vol.50, No.37, 11 September 2013), pp.32-40.

[72] Tim Benbow and James Bosbotinis, 'The Interoperability of Future UK Air Power, Afloat and Ashore: A Historical Analysis', *Corbett Paper* No.13 (The Corbett Centre for Maritime Policy Studies, January 2014), especially pp.2-10.

from a sea base.[73] Further, a static air base is easier to operate from than an aircraft carrier (a runway is not subject to pitch or roll) and importantly, is not physically constrained in the same manner as a carrier; that is, an airbase allows the separation of runways, taxiways, arming and fuelling areas and permits aircraft dispersal, thus reducing vulnerability to attack. In contrast, aviation operations on a carrier have to be accommodated within the confines of the ship. However, as Wing Commander Neil Meadows, RAF, explains:

> To enable an airfield to 'generate and recover air power missions', a considerable number of functions are required. These comprise operations support (including Air Traffic Control, command and control, intelligence exploitation facilities, firefighting [sic] and rescue services), logistics (including flight line, air movements, fuel, storage and motor transport facilities) and administration (including personnel, resource and financial management, medical infrastructure, accommodation, catering and training facilities)… Therefore, land-based operations (even from a well-found operating base) are likely to involve the deployment of several hundreds of people (in addition to the aircrew and engineers…) at considerable economic, human and political expense. Conversely, an aircraft carrier's crew complement are trained to provide all of these support functions within the ship's operational role at no additional cost per deployment.[74]

An air base also presents force protection challenges distinct to those encountered by an aircraft carrier, namely due to the static nature of the base itself. An air base presents a fixed area target that is vulnerable to air and missile attack,[75] mortar fire and artillery. Carriers are also vulnerable to air and missile attack but have to be located first whilst an attacking missile requires a sufficient degree of sophistication for tracking and targeting a moving target. Air bases are also vulnerable to ground attack: either by conventional forces, by Special Forces or terrorist/irregular forces. Christopher J. Bowie illustrates this with regard to Special Forces, stating that 'Since 1942, special forces worldwide have conducted 645 separate attacks on airfields to destroy over 2,000 aircraft on the ground'.[76] Moreover, Special Forces have never destroyed a single aircraft on-board an aircraft carrier, nor have land forces ever overrun a carrier, in contrast to the many air bases ashore which have fallen. The September 2012 Taliban attack on the

[73] Interview with Air Vice-Marshal Michael Harwood CB CBE, London, 22 May 2014.
[74] Wing Commander Neil Meadows RAF, 'To Sea or Not To Sea: That is the Question', *Air Power Review*, Vol.3, No.1 (Spring 2000), pp.82-106, quotation pp.94-95.
[75] For analysis of this threat, see John Stillion and David T. Orletsky, 'Airbase Vulnerability to Conventional Cruise-Missile and Ballistic-Missile Attacks: Technology, Scenarios and U.S. Air Force Responses' (RAND Corporation, 1999); and Christopher J. Bowie, 'The Anti-Access Threat and Theater [sic] Air Bases', (CSBA, 2002).
[76] Bowie, 'The Anti-Access Threat and Theater [sic] Air Bases', p.iv.

airfield at Camp Bastion provides a notable example of the threat to airfields; in that attack, the Taliban successfully destroyed six per cent of the entire USMC Harrier fleet.[77] Meadows summarises the force protection challenge thus:

> Static airfields are vulnerable to enemy attack and, although it seems highly unlikely that a single (conventional) weapon could close an airfield for a protracted period, there remains a significant threat to deployed forces, particularly from 'asymmetric' attack. The threat could be passive in the form of covert observation and reporting, or it could be active in the form of air, ground, information or Nuclear, Biological and Chemical (NBC) attack. There is a fundamental requirement, therefore, to provide physical protection at deployed operating bases for aircraft, airfield surfaces, people, equipment and information. Protection measures would include Ground-Based Air Defences, Battle Damage Repair teams and the use of organic ground combat units to provide enhanced perimeter security.[78]

Squadron Leader Dave Watkins, RAF, illustrates the challenge of providing enhanced perimeter security, especially to counter indirect fire, with reference to US experience in the Vietnam War:

> The US forces in Vietnam discovered the benefits of creating defended zones around their airfields that were usually situated close to built-up areas. In order to avoid rocket or mortar attacks these zones could be as large as 10 km from the airfield perimeter, with the most vulnerable area being that zone between 5,000m [sic] and 10,000 m. Within these huge areas, key terrain must be identified and most likely weapon launch sites dominated by either view or patrolling in order to make the defender's task manageable.[79]

The threat to airbases, particularly in the face of high-end A2/AD threats (represented at the top end by the Chinese People's Liberation Army)[80], has prompted much debate, especially within the US, on both passive (including dispersed operations and hardening airbase facilities) and active (including measures to enhance counter-ballistic and cruise missile capabilities) means of defence.[81] One aspect of the debate concerning the threat to airbases is that of whether an adversary could coerce the host nation into withdrawing basing rights. In this regard, Jan Van Tol cites Chinese military literature suggesting an

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[77] Peter Felstead, 'Bastion Attack Leaves ISAF Rethinking Security', *Jane's Defence Weekly*, Vol.49, No.39 (26 September 2012), p.4.
[78] Meadows, p.94.
[79] Squadron Leader Dave Watkins, Royal Air Force, 'Airbase Defence: The Optimum Strategy to Counter Modern Threats to Joint Air Operations', *Air Power Review*, Vol.7, No.3 (Autumn 2004), pp.77-92, quotation, pp.79-80.
[80] For an overview of Chinese A2/AD capabilities, see Andrew F. Krepinevich, 'Why AirSea Battle?' (CSBA, 2010); and Jan Van Tol with Mark Gunzinger, Andrew Krepinevich and Jim Thomas, 'AirSea Battle: A Point-of-Departure Operational Concept', (CSBA, 2010).
[81] The aforementioned CSBA papers provide detailed analysis of this debate.

objective for Chinese air and missile forces in the event of conflict would be to: 'Threaten all US operating bases in the Western Pacific, including those in Japan, with persistent ballistic and cruise missile attacks — the concomitant ability to strike allies and partners has implications for their willingness to support US basing access…'[82]

The issue of securing access, basing and overflight (ABO) rights constitutes a particularly problematic area for land-based airpower. This applies in particular to combat aircraft: securing ABO for support assets, such as transport, air-to-air refuelling and surveillance aircraft is much easier.[83] The denial or limitation of ABO can have major operational implications, including potentially resulting in the abandonment or substantial re-shaping of an operation.[84] As Tim Benbow explains:

> Since 1945 British defence policy has repeatedly been attracted to the siren calls of those urging the adoption of the suspiciously convenient assumption that air bases and overflight rights will always be available where and when needed. Yet repeatedly even close allies have proved unwilling (or, perhaps for domestic or regional political reasons, unable) to allow the use of their facilities or skies.[85]

In contrast, in AP 3000 *British Air and Space Power Doctrine* (although ostensibly joint, AP 3000 was produced under the auspices of the RAF), it was argued:

> All forms of military power depend on basing and support, and aircraft are no exception. Air power's requirements for access, basing and over-flight rights are often cited as a weakness, but in reality, the employment of British air power in the post-Cold War era has invariably been consistent with legal and moral justifications understood by the states neighbouring the zone of crisis, and gaining host nation support has rarely proved to be a significant problem.[86]

However, experience in both the 1990s and the last decade would suggest that the argument in AP 3000 is quite inaccurate. For example, attempts to secure basing rights in Italy for operations over Bosnia in the early 1990s were problematic (a

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[82] Jan Van Tol, 'AirSea Battle: A Point-of-Departure Operational Concept', (CSBA, 2010), p.19.
[83] Interview with retired senior MoD official, London, 10 June 2014.
[84] For example, Turkey's decision not to grant ABO to the US and UK forced a major revision to plans for opening a northern front against Iraq during Operation *Iraqi Freedom/Telic* in 2003. For discussion of British thinking on the 'northern option', see House of Commons Defence Committee (HCDC), *Lessons of Iraq*, Third Report of Session 2003-04, Volume 1, HC 57-1 (London: The Stationery Office, 2004), pp.44-48.
[85] Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships', p.8.
[86] Royal Air Force, AP 3000 *British Air and Space Power Doctrine* (Fourth Edition) (Ministry of Defence: 2009), p.18.

planned US deployment of F-117 strike aircraft was refused);[87] and the deployment of HMS *Invincible* for Operation *Bolton* in the Persian Gulf in November 1997 was the result of a failure to secure overflight rights in the Middle East which prevented RAF Tornados from deploying to the region.[88] Initial operations over Afghanistan in 2001 had to be conducted from aircraft carriers and by long-range bombers due to an absence of regional basing for tactical aircraft;[89] securing ABO for Operation *Telic*, as previously noted with regard to Turkey, was difficult;[90] and despite being a close ally, Oman has not permitted combat aircraft to be based on its territory for operations over Afghanistan.[91] In 2011, friction between the British and Italian authorities nearly resulted in the withdrawal of basing rights at Gioia del Colle - the main base for RAF Typhoon and Tornado operations over Libya.[92] This indicates both the flawed nature of the argument in AP 3000 and the SDSR's assumption, summarised by Tim Benbow that 'Britain will for the next ten years (although not thereafter) always enjoy unfettered access to ample, high quality, secure bases and to overflight, free of political constraint, available exactly where and precisely when it is needed'.[93] This is, as Benbow adds:

> Unambiguously contradicted by recent history; the burden of proof must lie on those who assert such a huge change in international politics, yet this bold prophesy was presented without evidence or argument – the lack of which creates the strong suspicion that the true driver of the decision-making was less a careful consideration of strategy and requirements than short-term book balancing that targeted capabilities out of favour with the then senior military leadership.[94]

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[87] Lee Willett, 'To Have or Not To Have – That is the Question: Host Nation Support and British Overseas Force Deployment Options', *RUSI Journal*, Vol.143, No.1 (February 1998), pp.36-41.
[88] John Roberts, *Safeguarding the Nation: The Story of the Modern Royal Navy* (Barnsley: Seaforth Publishing, 2009), pp.244-245.
[89] The first sorties by land-based tactical aircraft were conducted on the tenth day –October 17 2001 - of Operation *Enduring Freedom* by US Air Force F-15Es flying from Kuwait. Benjamin S. Lambeth, 'Air Power Against Terror: America's Conduct of Operation Enduring Freedom', (RAND Corporation, 2005), pp.91-92.
[90] Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships', p.52.
[91] Interview with Captain Jock Alexander OBE Royal Navy, (then) Naval Staff – Assistant Head Carrier Strike and Aviation, London, 3 May 2012.
[92] I am grateful to Commander Henry Mitchell, Royal Navy, for this insight.
[93] Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships', p.7.
[94] Ibid. The Chief of the Defence Staff at the time of the SDSR was a Royal Air Force officer, Air Chief Marshal Sir Jock Stirrup; the Vice Chief of the Defence Staff was General Sir Nicholas Houghton, who replaced General Sir David Richards as Chief of the Defence Staff in 2013 (General Richards was appointed CDS in 2009 and took up the post in late 2010) (both are Army officers). See 'General Sir David Richards GCB CBE DSO ADC Gen', https://www.gov.uk/government/people/david-richards; and 'Sir Nick Houghton appointed new

Aside from the military implications of being unable to secure sufficient or satisfactory ABO, the political consequences of a failure to gain ABO, in the absence of alternatives (such as an aircraft carrier) and with it an inability to respond to a threat to a national interest, would be significant. In this regard, one could reflect on the consequences for British international credibility had Britain not possessed aircraft carriers in 1982 and been forced to accept Argentina's seizure of the Falkland Islands.

In light of the risk associated with being dependent on ABO, and thus only land-based aviation, the requirement for *credible* maritime airpower is highlighted; this was stated in the SDSR, albeit whilst suggesting it did not apply for the next decade. The 2010 National Security Strategy, *A Strong Britain In an Age of Uncertainty*, defines Britain's role in the world in the following terms:

> In order to protect our interests at home, we must project our influence abroad. As the global balance of power shifts, it will become harder for us to do so. But we should be under no illusion that our national interest requires our continued full and active engagement in world affairs… To do so requires us to project power and to use our unique network of alliances and relationships – principally with the United States of America, but also as a member of the European Union and NATO, and a permanent member of the UN Security Council. We must also maintain the capability to act well beyond our shores and work with our allies to have a strategic presence wherever we need it.[95]

The concluding statement in the above quotation declaring Britain must 'have a strategic presence wherever we need it' can only be fulfilled with certainty by the possession of credible carrier airpower. There are two facets to the development of a credible maritime air capability; firstly, the provision of suitably-configured ships and air-groups,[96] and secondly, a force generation process guided by a full awareness of the requirements of aviation operations at sea. The latter necessarily raises the contentious question of ownership. The RAF has, since its inception, consistently argued for the 'indivisibility of airpower', a principle Professor Geoffrey Till explains thus:

> The air was the air wherever it was and took on no special quality when it was over the sea. The essential thing was to provide a force that was well equipped and

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defence chief', BBC News, 19 March 2013, http://www.bbc.co.uk/news/uk-21843660. Accessed 13 September 2013.

[95] HM Government, *The National Security Strategy*, p.4.

[96] The specific utility of an aircraft carrier is dependent on the capability it delivers, reflected in the size, composition and credibility of its embarked air-group.

> manned by those experienced in the science of air warfare. Naval flying held no special mysteries and its particular requirements could be learned by trained airmen without undue difficulty.[97]

The RAF perspective toward naval aviation is based on three central pillars: efficiency, capability, and ownership.[98] Sea-based aviation is perceived to be less efficient than land-basing, in particular due to the overhead costs associated with an aircraft carrier force and in terms of the number of aircraft that can be embarked on a carrier. Moreover, sea-basing is perceived to result in a sacrificing of capability; that is, carrier airpower is argued to be of a qualitatively lower standard than land-based aviation. Arguments concerning efficiency and capability also feed into the view that naval aviation should not be under separate ownership. In this respect, a separate Fleet Air Arm plus its associated training stream holds no economies of scale. A separate naval air arm also raises issues in terms of command and control, in particular with respect to running contrary to the RAF's philosophy of centralised command, decentralised execution. This approach is explained in JDP 0-30 *Air and Space Power Doctrine*:

> Centralised control is essential to unity of command. It means we can allocate and apportion inevitably scarce resources to meet commanders' intent in line with the priorities they set. Centralised control embodies the principle of strategy-to-task, ensuring that we use air assets as efficiently as possible to achieve the military strategic objectives set by higher authority. However, while centralised control remains at the heart of air command and control, developing technology and the ubiquity of networked communications mean we can often choose to either centralise or decentralise execution authority, depending on the specific circumstances of the campaign.[99]

Further, it is argued that there are problems associated with reconciling different service control, and their respective cultures, over airpower components, leading to a reduction in operational effectiveness and command and control issues.[100]

As recently as 2008/2009, the RAF argued for a rationalisation of British airpower, including complete ownership of all fixed-wing aircraft; the then Chief of the Air Staff, Air Chief Marshal Sir Glenn Torpy asserted that 'We have got to kill some scared [sic] cows to make ourselves efficient. The general public

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[97] Geoffrey Till, *Air Power and the Royal Navy 1914-1945* (London: Jane's, 1979), p.31.
[98] Interview with Professor Philip Sabin, London, 13 May 2014.
[99] MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, July 2013), p.3-30. This approach has been superseded by centralised command, adaptive execution. Ibid., pp.3-31 to 3-32.
[100] This analysis of the RAF perspective on naval aviation draws significantly on the insight of Professor Philip Sabin.

demand and deserve value for money and if that means we have to rationalise, that is what we have got to do'.[101] This public statement occurred within the context of a major inter-service dispute revolving around an RAF attempt to scrap Joint Force Harrier;[102] the RAF had been working since 2006 to remove the Harrier from service.[103] In response, Major General (now Lieutenant General Sir) Paul Newton, then head of the MoD's Development, Concepts and Doctrine Centre, was tasked to investigate the matter and produce a report examining the size of the force, its ethos and manning.[104] The RAF contended that no Royal Navy input was necessary; the Royal Navy disagreed on two points: first, that there was no precedent anywhere for naval air operations that were not supervised by those with deep maritime knowledge; and second, that the RAF have consistently shown a determination to avoid going to sea.[105] The Newton Report reemphasised the need for a sizeable portion of Joint Force Harrier to be naval,[106] identified nearly 200 posts on the in-service *Invincible*-class that required naval experience and concluded that only the Royal Navy could produce the manpower to operate the *Queen Elizabeth*-class.[107] Newton also recommended that, in order to generate 36 F-35 force elements at readiness, a minimum of 25 per cent, subsequently increased to 33 per cent of the then planned 138-strong F-35 force should be Royal Navy-owned.[108]

Following on from the Newton Report, a study in 2012 under Edward Ferguson within the Ministry of Defence has also found that the F-35B must be operated 'in sufficient numbers to provide a viable power-projection capability, thereby maximising the return on investment, and must also be operated by members of the Royal Navy'.[109] This study was commissioned to resolve a post-SDSR debate concerning the size and duration of JCA embarkations on the *Queen Elizabeth*-class; the RAF were advocating deployments of small numbers of aircraft, perhaps

[101] Sean Rayment, 'RAF Chief Predicts Controversial Takeover of Royal Naval Air Power', *The Telegraph*, 7 June 2009.
[102] Richard Scott, 'Over Land and Sea', *Jane's Defence Weekly*, Vol.46, No.33 (19 August 2009), pp.28-31.
[103] Interview with Admiral Sir Jonathon Band, London, 23 June 2014
[104] Ibid.
[105] Interview with Rear Admiral Cunningham.
[106] Interview with Admiral Sir Jonathon Band.
[107] Interview with Captain Alexander.
[108] Ibid.
[109] Tobias Ellwood, MP, 'Leveraging UK Carrier Capability: A Study into the Preparation for and Use of the *Queen Elizabeth*-Class Carriers', *RUSI Occasional Paper*, September 2013, p.6.

four to six, for short durations, whilst, in contrast the Royal Navy were arguing for routine squadron-strength deployments for extended periods.[110]

The Experience of Joint Force Harrier[111]

As previously discussed in chapter three (see page 123), in order to secure at least grudging acceptance of a continued carrier-based fixed-wing capability, the Royal Navy sought to promote the *Queen Elizabeth*-class aircraft carriers as 'joint defence assets' and share the provision of the fast jet element of British sea-based airpower with the RAF via the creation of Joint Force Harrier. The force was intended to be two-thirds RAF and one-third Royal Navy; in practice, the RAF share was higher, in part due to the Royal Navy finding it difficult to recruit enough pilots.[112] In terms of force readiness, out of three squadrons, one was intended to be at high-readiness and principally carrier-based; the second would be embarked half the time; and the third squadron was to be mainly shore-based.[113] Although the notion of a joint force may be attractive, in practice, the experience of JFH was less than satisfactory, mainly due to problems in integrating Royal Navy and RAF personnel on-board carriers,[114] reluctance on the part of the RAF toward embarked operations and the focus on land-based operations in Iraq and Afghanistan.

Although JFH was intended to be a joint force and to produce interoperable land and sea-based squadrons, embarked RAF activity was infrequent and small-scale; the most notable joint deployment being the 2005 *Marstrike* 05 exercise which saw the deployment of eight RAF Harrier GR7s from IV Squadron deploy aboard HMS *Invincible*, alongside seven Sea Harrier FA2s of 801 Naval Air Squadron.[115] Following the retirement in 2006 of the Royal Navy's Sea Harrier FA2, embarked activity dropped significantly, impacting the training and number of night-qualified pilots as well as flight deck safety, efficiency and the carriers' war-

[110] Richard Scott, 'Re-assembling the Jigsaw: Regenerating UK Carrier Strike Capability', *Jane's Navy International*, Vol.119, No.6 (July/August 2014), pp.18-23, especially, p.20.
[111] For more comprehensive discussion of Joint Force Harrier, see Benbow and Bosbotinis, 'The Interoperability of Future UK Air Power', pp.20-27.
[112] Interview with senior retired Royal Air Force officer, 17 June 2014.
[113] Interview with Admiral Sir Jonathon Band.
[114] Interview with Air Vice-Marshal Harwood.
[115] For coverage of this exercise, see Richard Scott, 'Striking Back', *Jane's Defence Weekly*, Vol.42 No.11 (16 March 2005), pp.28-30; and Roberts, p.298.

fighting potential.[116] Moreover, between 2003 and 2007, the FAA lost influence within JFH.[117] At the time of the Sea Harrier retirement, 50 per cent of pilots were night capable: at the time of the withdrawal of the Harrier GR9, only four to five per cent of pilots were night-capable and they were mostly former Sea Harrier pilots.[118] This reduction in capability can be attributed to the decline in embarked activity, as illustrated by Exercise *Hajjar Osprey* (March/April 2008), where only four Harriers were embarked on *Illustrious* for a period of approximately three weeks.[119] Attaining full day and night deck qualification would typically require at least 18 months front line service.[120] Moreover, a lack of embarked activity would have a detrimental effect not only on the operational capability of the pilots but also on the wider ship-air interface.

The irregular frequency and brief periods spent embarked at sea by RAF Harriers indicated that the level of capability that could be provided in the maritime environment by the RAF JFH squadrons would be limited. This is not unexpected as the RAF considered the Harrier force to be primarily a land-based capability. The demands of operations in Iraq and especially Afghanistan further reduced the time that RAF Harrier units – and after the withdrawal of the Sea Harrier, all Harrier units – spent embarked at sea. The figure from 2005 onwards of six weeks per year embarked[121] indicates a most basic daytime capability, with serious limits to its military credibility and hence political utility.[122] The decline in the number of pilots night-qualified for embarked flying, the lack of embarked experience and the focus on operations in Afghanistan turned JFH in its latter stages into a predominantly land-based force, despite the original intention of a more versatile, interoperable capability.

It is intended that the F-35B will be operated as a joint force and provide an interoperable land and sea-based capability as was envisaged for JFH. The stated

[116] Interview with Commander Henry Mitchell, Royal Navy, 1 August 2012. Commander Mitchell was the final Commander Sea Harrier Force.
[117] Interview with Admiral Sir Jonathon Band.
[118] Interview with Commander Mitchell, 1 August 2012.
[119] Roberts, pp.329-330.
[120] Rear Admiral Scott Lidbetter, 'Joint Force 2000 – On Track or Coming off the Rails?' *The Naval Review*, Vol.91, No.4 (November 2003), pp.349-353.
[121] Covington, p.103.
[122] I am grateful to Commander Mitchell for this insight.

requirement is currently for 48 F-35Bs,[123] sufficient to equip four squadrons, which will enable, as explained by Commodore Bill Covington, Royal Navy, with regard to JFH:

> The need for four squadrons is based on deployability. [Post-Sea Harrier, the GR9] will have to sustain sea-based training and detachments in addition to land-based activities… It is believed that four deployable units will provide the best baseline structure… and this format and its adaptability in terms of scaling detachment sizes and shapes for operations will be tested before JFH makes way for JCA.[124]

The experience of JFH may prompt concern that Joint Force Lightning (the name given to the F-35) will be similarly constrained. As noted on pages 189-190, the Royal Navy and RAF have different perspectives on how carrier-based airpower should be utilised. The former advocated a concept-of-operations where the ship sails with its air-group embarked (the traditional approach to carrier operations): whereas the latter advocated an approach where the ship will sail with just its helicopters and only embark its fast jets subsequently and for limited periods.[125] Attaining the necessary level of credibility to coerce or reassure will require a substantial investment both financial and temporal in embarked training at sea to ensure that both aircrew and support personnel are proficient in operating on-board and from the carrier.

It is argued that this requires the air-group to be regularly embarked for sustained periods in order to attain a high level of basic day and night proficiency in carrier operations; the occasional detachment to the ship of some aircraft, in isolation from other aircraft types, will neither constitute a credible capability nor develop cohesive operational performance.[126] In contrast, it is also argued that the evolving technological context, for example, the impact of simulation, changes the requirement for working-up at sea, and that the most challenging aspect of air operations is in-the-air integration; that is, operating the aircraft proficiently and

[123] HCDC, *Ministry of Defence Annual Report and Accounts 2011-12*, Ninth Report of Session 2012-13, HC 828 (London: The Stationery Office, 2013), p.31.
[124] Covington, p.103.
[125] Interview with (then) Captain Alexander. See also Benbow and Bosbotinis, 'The Interoperability of Future UK Air Power', pp.7-10.
[126] I am grateful to Commander Mitchell for this insight.

within a complex battlespace.[127] The main area for focus, rather than being the aircrew, should be the on-deck maintainers and command and control.[128]

How the *Queen Elizabeth*-class will be used will be the next area of debate,[129] and the above difference in operational approach forms a facet of this. The prospects for Joint Force Lightning are positive; the RAF has accepted split ownership of the F-35 force (the RAF needs Royal Navy involvement to justify a fifth generation force)[130] and the creation of an expeditionary training unit at RAF Leeming (a recommendation emanating from experience in Operation *Ellamy*) has resulted in the RAF and Royal Navy (along with the Army) working together in a genuine tri-service context.[131] Moreover, in contrast to the JFH period, where the Harrier was one of three fast jets in British service alongside the Tornado and Typhoon, and a target of rationalisation initiatives, the F-35 will be the 'flagship' fast jet in service and thus a core asset for both the Royal Navy and RAF. This should perhaps ensure that Joint Force Lightning is seen to succeed.

The USMC approach to developing an expeditionary airpower capability may be a valuable example for the UK. The USMC seeks to deploy interoperable land and sea-based squadrons, but in order to achieve this capability, squadrons preparing for sea-based deployments require a 'complex and intense training period prior to deployment.'[132] This can involve a 'minimum of 3 months prior to the ship's/CVW's refresher training (RefTra) or 3 months prior to initial embarkation aboard ship for type training'.[133] US Marine Corps experience points to the requirement for dedicated assets in order to develop a credible maritime aviation capability (it also highlights the limited capability JFH would have delivered with only six weeks embarked time per year). Moreover, to fully exploit such a capability, which in addition to providing a sea-based force also inherently provides a force capable of operating from land, would ideally require a full awareness of the strategic utility of maritime forces and their wider role in, and

[127] Interview with Air Vice-Marshal Harwood.
[128] Ibid.
[129] Interview with senior retired military officer, London, 5 June 2014.
[130] Interview with Professor Sabin.
[131] Interview with Dr Christina J. M. Goulter, Shrivenham, 20 May 2014.
[132] Headquarters United States Marine Corps, 'Deployment of Marine Corps Aviation Units on Aircraft Carriers; Preparation for', MCO 3500.18 W/CH 1, 20 August 2004 (originally promulgated 27 February 1984), p.1.
[133] Ibid., p.3.

contribution to national defence policy: this will be examined in depth in the following chapter.

Conclusion

The purpose of this chapter has been to examine the capabilities, costs and benefits of potential alternatives to the traditionally conceived aircraft carrier. It has done so within the framework of Britain seeking direct alternatives to a carrier-based capability, at similar cost and to maintain, consistent with declared policy, a capability to project power globally. In this regard, options requiring radical change in overall defence and foreign policy, such as abandoning wholesale a power projection capability, have not been considered yet it is only a change in defence posture of this scale that could justify a move away from carriers. The preceding analysis has shown that although ostensibly viable alternatives to the carrier exist – for example, missile-armed submarines and surface combatants and land-based aviation – they do not provide, in the case of the former, the same degree of flexibility across roles as a carrier, or in the case of the latter are dependent on securing ABO. Nor do they offer significant cost savings when compared to the cost of acquiring a carrier. The multi-role amphibious assault ship, or LHD, could provide a viable alternative to a small or mid-sized carrier, albeit accepting a restricted fixed wing strike capability but providing an enhanced means of supporting amphibious and helicopter operations. (This will be returned to in the following chapter.) Yet it did not meet the stated requirement of policy when the government decided to build CVF.

It would be wrong to view the aircraft carrier as a panacea, as Benbow states: 'Carriers … have limitations in their ability to dominate ground and in the scale of effort that they can take on without the backing of land-based forces. Nevertheless, they offer unique advantages and are essential for a viable British strategy'.[134] The utility of aircraft carriers is based on their combining the attributes of maritime forces, especially the key attributes of access, mobility, versatility, sustainability and leverage, with the attributes of airpower (namely,

[134] Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships', 'Key Points'.

speed, reach, height, ubiquity, agility and concentration)[135]. That is, maritime airpower constitutes a leading example of cross-domain synergy.[136] This sets apart the aircraft carrier from other naval forces; a carrier task group operates within the naval environment and can project, on a sustained basis, power into the air and land domains; other naval force structures, such as the distributed missile-armed force advocated by, for example, Rubel, Hendrix and Pournelle, cannot operate across domains to anywhere near the same extent as a carrier group. Land-based airpower, although capable of projecting power on a sustained basis into the maritime and land environments, does not have the mobility (and therefore strategic, operational or tactical flexibility) or access of sea-based airpower. Further, it cannot undertake certain naval roles, and is constrained by the requirements of ABO and the various support functions (logistics, force protection, etc.) needed to generate airpower whereas sea-based aviation is self-contained within the carrier.

At its most fundamental level, the British debate on the design, development and acquisition of the *Queen Elizabeth*-class aircraft carriers is a debate on the role and utility of maritime forces, and even more broadly, that of a maritime strategic perspective vis-à-vis a continentalist approach to fulfilling Britain's military and grand strategic requirements. The following chapter will examine the roles and utility of a maritime strategy to Britain and consider the implications of such a strategy for maritime and wider force development; in this regard, the development of the future aircraft carrier programme holds lessons for the future development of British defence policy.

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[135] For explanation of the attributes of airpower, see RAF, *AP 3000 British Air and Space Power Doctrine*, pp. 16-17.

[136] 'The complementary vice merely additive employment of capabilities in different domains such that each enhances the effectiveness and compensates for the vulnerabilities of the others'. Department of Defense (DoD), *Joint Operational Access Concept (JOAC)* (Version 1.0, 17 January 2012), p.14. Also see Commander Nick Walker, Royal Navy, 'The Maritime Perspective of Air Power', *Air Power Review*, Vol.13, No.1 (Spring 2010), pp.69-79, particularly p.73.

6. The Future Aircraft Carrier Programme and British Maritime Strategy

Introduction

The purpose of this chapter is to examine the utility of a potential maritime strategy to British national policy. That is, what value do armed forces operating at or from the sea have in terms of contributing toward the attainment of national political objectives? The chapter builds upon the analysis in chapters one and two, which considered the definition and British interpretation of maritime strategy, and the analysis in the following chapters of the debates concerning the rationale for and design and development of the Future Aircraft Carriers, in particular with regard to the wider role and contribution of the carriers to British defence and national policy, and asks 'why a maritime strategy?' A maritime strategy is defined, as stated by Vice Admiral Sir Peter Gretton (see page 78), and proceeding from the earlier work of Sir Julian Corbett, Admiral Sir Herbert Richmond and Captain Stephen Roskill, as being an inherently joint endeavour; and building upon the inter-dependence of the three armed services, it should seek to integrate the efforts of the three services in pursuit of success.

In order to do this, the chapter examines the debate concerning the procurement of the *Queen Elizabeth*-class aircraft carriers within the context of wider British defence policy. It does so with particular regard to the impact on the programme of growing external pressures, namely, those relating to the implications of the conflicts in Iraq and Afghanistan, and the politico-economic context for the 2010 Strategic Defence and Security Review (SDSR). Within this context, the chapter also considers the perception of the strategic utility of maritime power within the defence and national security policy-making establishment and the extent to which defence and national policy are based on a long-term strategic perspective. Proceeding from this, the chapter examines the rationale for, and utility of a potential maritime strategy for Britain. It does this by first considering Britain's strategic context (for example, its position as an insular, maritime trading nation) and the evolving strategic environment (including such factors as the shifting international balance of power, future character of conflict and geo-economic

constraints). This provides the context for considering the military utility of a maritime strategy, its implications for maritime and wider force development and British national policy, and the potential circumstances under which such a strategy would be adopted.

At the core of this chapter is the question: why a maritime strategy? This question is especially significant, as Sir Julian Corbett explained:

> We are accustomed … to speak of naval strategy and military strategy as though they were distinct branches of knowledge which had no common ground. It is the theory of war which brings out their intimate relation. It reveals that embracing them both is a larger strategy which regards the fleet and army as one weapon, which co-ordinates their action, and indicates the lines on which each must move to realise the full power of both. It will direct us to assign to each its proper function … it will enable each service to realise the better the limitations and the possibilities of the function with which it is charged, and how and when its own necessities must give way to a higher or more pressing need of the other. It discloses, in short, that naval strategy is not a thing by itself, that its problems can seldom or never be solved on naval considerations alone, but that it is only a part of maritime strategy – the higher learning which teaches us that for a maritime State to make successful war and to realise her special strength, army and navy must be used and thought of as instruments no less intimately connected [than are the three arms ashore].[1]

It is in this context that the CVF programme is particularly valuable as a case study. The debates surrounding the design and development of the *Queen Elizabeth*-class aircraft carriers have extended beyond a consideration of naval factors and considered wider military and grand strategic factors, especially those pertaining to air strategy and the maritime industrial base. It is for this reason that the carrier debate is of such significance to the broader question of whether Britain requires a maritime strategy.

As with the preceding chapter, for the purposes of the analysis in this chapter, it is assumed, as a baseline, that British national policy will remain predicated on possessing the means to project power and influence, albeit on a limited scale, globally.[2] The SDSR described Britain's national policy aims thus:

> The National Security Strategy sets out two clear objectives: (i) to ensure a secure and resilient UK by protecting our people, economy, infrastructure, territory and

[1] Sir Julian Corbett, *Some Principles of Maritime Strategy* (reprinted with 'Introduction' by Eric Grove (Annapolis, MD: Naval Institute Press, 1988)), pp.10-11.
[2] See Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The National Security Strategy*, Cm 7953 (London: The Stationery Office, 2010), p.4.

> ways of life from all major risks that can affect us directly; and (ii) *to shape a stable world, by acting to reduce the likelihood of risks affecting the UK or our interests overseas, and applying our instruments of power and influence to shape the global environment and tackle potential risks at source*.[3]

National policy provides the basis from which strategy is developed and the objectives toward which armed force will be applied, or as eloquently expressed by Carl von Clausewitz, 'at the highest level the art of war turns into policy – but a policy conducted by fighting battles rather than by sending diplomatic notes'.[4] In this light, the importance of determining the strategic utility of maritime power – of which the *Queen Elizabeth*-class aircraft carriers will be a major component – is highlighted: for policy to make effective use of its armed instrument, the utility of that instrument must be known in order for it to be used appropriately.

The Aircraft Carrier Debate, Maritime Strategy and British Defence Policy

The purpose of this section of the chapter is to consider the debate concerning the development and procurement of the *Queen Elizabeth*-class aircraft carriers within the context of wider British defence policy and its implications for the perception of the broader utility of maritime power. It particularly takes account of the influence of countervailing factors on the debate surrounding the carrier programme, which by the time of the SDSR in 2010, enjoyed little support in the Ministry of Defence (MoD) outside the Royal Navy and was under intense pressure financially.[5] Moreover, there was a widespread senior military opinion that the *Queen Elizabeth*-class aircraft carriers should have been scrapped,[6] a view reportedly held by the Defence Strategy Group,[7] albeit contingent on the extent of

[3] Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (SDSR), Cm 7948 (London: The Stationery Office, October 2010), p.9. Emphasis added.
[4] Carl von Clausewitz, *On War*, Edited and Translated by Michael Howard and Peter Paret (Princeton, New Jersey: Princeton University Press, 1976), p.607.
[5] Interview with senior retired military officer, London, 5 June 2014.
[6] Interview with Rear Admiral Tom Cunningham CBE, (then) Rear Admiral Fleet Air Arm, Portsmouth, 16 May 2012.
[7] The Defence Strategy Group is co-chaired by the Permanent Under-Secretary in the Ministry of Defence and the Chief of the Defence Staff, and includes as members, the Vice Chief of the Defence Staff, the Chief Executive of Defence Equipment and Support, the Directors General of Security Policy and Finance, the Deputy Chiefs of the Defence Staff for Military Strategy and Operations and Military Capability and the Chief Scientific Advisor. It supports the Permanent Under-Secretary and Chief of the Defence Staff in formulating advice on defence strategy. Ministry of Defence, *How Defence Works* (April 2014), p.13. For the SDSR, the Defence Strategy

the financial constraints to be imposed on the defence budget during the SDSR process.[8]

The pressures on the carrier programme were, to a significant extent, also symptomatic of wider tensions in British defence policy, deriving particularly from a combination of the impact of the campaigns in Iraq and Afghanistan, an Army-led debate over the evolving character of conflict and thus Britain's military requirements,[9] and the post-2008 economic downturn exacerbating an already-increasingly constrained defence resource base. The consequence of these tensions was, as Professors Paul Cornish and Andrew Dorman, both noted strategic commentators, explained: '…Policy and strategy are now being defined in the short term, rather than with much sense of what might lie beyond the immediate horizon. This tendency has been exacerbated by the fiscal pressures … which have heightened interservice [sic] rivalry to an extent not seen for many years'.[10] In this environment, the case for the aircraft carriers particularly, and maritime forces more generally, was disadvantaged, especially vis-à-vis those forces (for example, protected infantry) seen as more relevant to the immediate requirements of operations in Afghanistan. This is in marked contrast to the SDR where the case for the then future carrier programme was central to the wider expeditionary approach articulated.

The Shifting Defence Policy Context

Although the SDR was perceived as a major success both in terms of process and 'for bringing foreign and defence policy together in a clear, coherent and affordable fashion'[11] the equipment programme set out in the review was inherently unstable.[12] This was due to an initial £2 billion funding shortfall based

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Group was chaired by the Secretary of State for Defence. National Audit Office, *Carrier Strike*, HC 1092, Session 2010-2012 (London: The Stationery Office, 2011), p.6, para 5.

[8] National Audit Office, *Carrier Strike*, HC 1092, Session 2010-2012 (London: The Stationery Office, 2011), p.28, para, 2.23.

[9] For an overview of this debate, see Paul Cornish and Andrew Dorman, 'Blair's War and Brown's Budgets: From Strategic Defence Review to Strategic Decay in Less than a Decade', *International Affairs*, Vol.85, No.2 (March 2009), pp.247-261, particularly pp.255-256; and Hew Strachan, 'One War, Joint Warfare', *RUSI Journal*, Vol.154, No.4 (August 2009), pp.20-24.

[10] Cornish and Dorman, 'Blair's Wars', p.257.

[11] Ibid., p.248.

[12] Interview with Admiral Sir Nigel Essenhigh, Fareham, 29 May 2014.

on unrealised assumptions relating to potential efficiency savings.[13] The funding deficit in the equipment programme became an enduring problem, and alongside the cost of operations in Iraq and Afghanistan, was a significant constraint on MoD resources; the scale of this constraint is indicated in the SDSR: 'The legacy of over-commitment in the Defence programme amounted to around £38 billion. Some £20 billion of this is related to unaffordable plans for new equipment and support'.[14] In this context, the carrier programme, constituting a whole package of capability at significant cost, was viewed in some quarters as providing an opportunity, through cancellation, to aid in rebalancing the budget.[15] Cornish and Dorman cited the carrier programme, alongside the *Astute*-class submarine, Type 45 destroyer, A-400M transport aircraft, Future Lynx helicopter and the Army's Future Rapid Effect System as major equipment projects listed by the then Permanent Under-Secretary at the MoD and the Chief of the Defence Staff (then Air Chief Marshal Sir Jock, now Lord, Stirrup) as options for cancellation presented to the prime minister in 2008.[16]

Notably, four of the six aforementioned projects were either naval or, in the case of the Future Lynx, a joint project with significant naval interest.[17] In part, this reflects the capital intensive nature of navies; warships and submarines constitute significant investments. Moreover, it also illustrates the particular circumstances of the first decade-plus of the 21st century as a period in which a number of major naval procurement programmes were underway simultaneously, that is, namely the *Astute*-class nuclear-powered submarines, the Type 45 *Daring*-class destroyers and CVF in addition to a number of auxiliary vessels.[18] This 'bow wave' of naval construction was in part due to the then government choosing to delay several programmes in order to help fund operations in Iraq and Afghanistan. At this point, it warrants highlighting that the CVF programme was, and remains central to the British military maritime industrial base, not least because the carrier

[13] Ibid.
[14] HM Government, *SDSR*, p.31
[15] Interview with retired senior military officer.
[16] Cornish and Dorman, 'Blair's Wars', p.260.
[17] The Future Lynx, now known as Wildcat, is the replacement for the Royal Navy's and Army's fleet of Lynx helicopters. For an overview, see http://www.naval-technology.com/projects/navy-future-lynx/. Accessed 4 July 2014.
[18] For an overview of British naval shipbuilding plans in this period and its implications for industry, see Mark V. Arena et. al., 'The United Kingdom's Naval Shipbuilding Industrial Base: The Next Fifteen Years' (RAND, 2005), pp.xvii-xxi.

programme bears the bulk of the overhead costs of British military shipbuilding (this is also a major factor in the continued cost growth of the carrier programme).[19] It was also a key driver for the Terms of Business Agreement (ToBA) signed between Her Majesty's Government and BVT (a joint venture established between BAE Systems and the VT Group for naval shipbuilding) in 2009.[20] The TOBA was intended to realistically downsize industry, following a period of expansion to produce the *Queen Elizabeth*-class carriers, in order to be capable of producing from the mid-2020s, a frigate-sized vessel every 18 months.[21] The industrial significance of the CVF programme will be discussed further below, in particular with regard to decision-making during the SDSR.

The inclusion of four major naval programmes out of six potential candidates for cancellation, however, is also indicative of the developing trend toward calling into question the relevance of high-end naval capabilities. This trend, as will be discussed below, was also evident in the analysis of British defence requirements articulated in some quarters of the think tank community.[22] Notably, the 2008 list of major projects, although identifying the A-400M transport aircraft, did not include the two largest (in cost terms) equipment programmes: the Typhoon/Typhoon Future Capability and the Future Strategic Tanker Aircraft (FSTA). The FSTA contract, which was let in 2008, was valued at £10.4 billion; in contrast, the CVF contract, also placed in 2008, was valued at £3.1 billion.[23] The forecast cost of the Typhoon/Typhoon Future Capability programme was not disclosed until 2010: projected at £18 billion, this programme was, and remains the largest post-Main Gate project by value.[24]

The cost of the carrier programme was also subject to criticism in the SDSR, stating that: 'This £20 billion programme was crowding out other important

[19] I am grateful to an anonymous industrial source for this insight.
[20] A redacted version of the TOBA is available online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/16847/BAESystemsSurfaceShipsTermsofBusinessAgreementREDACTED.pdf. Accessed 4 July 2014.
[21] Interview with retired senior military officer.
[22] See for example, the Institute for Public Policy Research, 'Shared Responsibilities: A National Security Strategy for the UK', The final report of the IPPR Commission on National Security in the 21st Century (IPPR, June 2009).
[23] Ministry of Defence, *UK Defence Statistics* (2009 edition), p.33.
[24] Ministry of Defence, *UK Defence Statistics 2010*, p.37. For current cost data, see the National Audit Office, *Major Projects Report 2013: Appendices and Project Summary Sheets*, HC 817-II, Session 2013-14 (London: The Stationery Office, 2014), p.177.

investment in the Armed Forces'.[25] The figure of £20 billion however does not solely refer to the acquisition of the *Queen Elizabeth*-class carriers but also 150 F-35 aircraft, which are intended to form a joint land and sea-based force operated by the Royal Navy and Royal Air Force. In this respect, the use of the combined cost of the carriers and the F-35, a closely linked but nonetheless separate programme, distorts the perception of the affordability of the aircraft carriers themselves. This is perhaps unsurprising given the aforementioned lack of support for the carrier programme in the MoD outside the Royal Navy and also the centrality of Afghanistan to the SDSR process. The issue of the cost of the carriers, in particular with regard to the contract governing their acquisition, will be returned to below in order to evaluate the decision in the SDSR to retain the ships.

The most significant shift in British defence policy in the first decade of the 21st century, and central to the growing argument against investment in high-end maritime forces, including the *Queen Elizabeth*-class aircraft carriers, was the undertaking of the campaigns in Iraq (concluded in 2009) and Afghanistan. These two campaigns have had a pronounced impact on British defence policy due to the Armed Forces not being suitably equipped at the tactical level; not having the appropriate doctrine at the operational level; and there being a lack of patience at the strategic level.[26] The effect of those campaigns, especially the enduring operation in Afghanistan (due to conclude by the end of 2014),[27] in particular with regard to the carrier programme and wider perception of the strategic utility of maritime forces, has been threefold. First, in terms of the impact on the budget and resources available to the MoD; second, as a catalyst for debate on the evolving character of conflict and Britain's military-strategic requirements; and third, contributing to a short-term outlook in policy and strategy.

The 1998 SDR, in addition to the previously cited planning assumption outlining the British contribution to a major international crisis (see page 130), articulated the following guidelines for smaller-scale and enduring contingencies:

[25] HM Government, *SDSR*, p.22.
[26] Interview with Admiral Sir Jonathon Band, London, 23 June 2014.
[27] Ministry of Defence, 'UK Forces: Operations in Afghanistan', https://www.gov.uk/uk-forces-operations-in-afghanistan (updated 19 June 2014). Accessed 5 July 2014.

> undertake a more extended overseas deployment on a lesser scale (as over the last few years in Bosnia) while retaining the ability to mount a second substantial deployment - which might involve a combat brigade and appropriate naval and air forces - if this were made necessary by a second crisis. We would not, however, expect both deployments to involve warfighting or to maintain them simultaneously for longer than six months.[28]

The operations in Iraq and Afghanistan vastly exceeded the above-defined planning assumptions, but also did not prompt an increase in overall resources available to the MoD. That is, the additional costs and resources incurred through operations in Iraq and Afghanistan would have to be met, for the most part, from within the existing defence budget. In 2008/09, for example, the net additional cost incurred by the MoD of operations in Iraq and Afghanistan was £4 billion.[29] The use of contingency funding outside of the MoD budget, including through the Urgent Operational Requirements (UOR) mechanism, provided some additional funding for resources directly relevant to operations in Iraq and Afghanistan, but as Cornish and Dorman explain, this did not alleviate the pressure on MoD resources:

> The number and size of UORs have grown remarkably, raising concerns within the Treasury that defence is now acquiring major capabilities through this channel, thereby sidestepping the normal acquisition process through which the Treasury has traditionally exercised its constraining function. The Treasury has also argued that a number of capabilities are not related to existing operations and has decided that UORs should be capped at a certain level (£900 million), with any further expenditure to be shared equally between the Treasury and the existing defence budget.[30]

The implication of this was that:

> UOR expenditure for the year to March 2008 was £1.7 billion, which meant that the existing defence budget has had a de facto cut of £400 million (the MoD's share of the £800 million excess). With operations in Afghanistan likely to continue for some time and with no slowdown projected in UOR expenditure, it seems likely that *the defence budget will continue to subsidize the war in Afghanistan at the expense of other defence capabilities*.[31]

Further, the operations in Iraq and Afghanistan were principally land campaigns with the Army as lead service. In this respect, the aforementioned tactical deficiencies primarily impacted on the Army, with a commensurate increase in

[28] Ministry of Defence, *The Strategic Defence Review*, Cm 3999 (London: The Stationery Office, 1998), p.32.
[29] MoD, *UK Defence Statistics* (2009), p.41.
[30] Cornish and Dorman, 'Blair's Wars', p.259.
[31] Ibid., pp.259-260. Emphasis added.

demand from the Army for additional resources to address those deficiencies. This had the effect of reducing Army support for the carrier programme; for example, both Field Marshal The Lord (then General Sir Charles) Guthrie (Chief of the Defence Staff, 1997-2001)[32] and General Sir Michael Jackson (Chief of the General Staff, 2003-2006) were initially supporters of the carrier programme.[33] This is not unexpected: a constrained defence budget limits the ability for the individual services to be joint.[34] The naval support budget, as an illustration of this, was 'raided' to pay for operations in Afghanistan.[35] General Sir Michael Jackson also illustrates this with regard to the first part of his tenure as Chief of the General Staff (CGS):

> … Besides dealing with Iraq, my first eighteen months as CGS were spent fighting the Army's corner in a cost-cutting exercise bizarrely entitled 'the medium-term work strands' – in effect, a mini defence review. The outcome was that the RAF had to shed about 10 per cent of its manpower and the Royal Navy lost some of its older ships. In the opinion of the MOD civil servants, the Army got away 'relatively lightly', losing some 1,500 soldiers from an establishment of about 104,000. In fact, we were in some ways ahead of the game: the Army staff had already come to the conclusion that the balance of capabilities within the Army was out of kilter.[36]

This quotation contains two points of significance: first, it illustrates the growing resource constraints confronting the MoD whilst the Armed Forces were engaged in Iraq (a situation exacerbated by the growing commitment to Afghanistan from 2006 onward). Second, it refers to the roots of the shift in focus for the Army that was to emerge later in the decade as advocacy for a wider change in British defence policy, that is, a move toward a greater focus on stabilisation operations (see below).

The budgetary constraints afflicting the MoD had by 2008, as discussed above, resulted in the carrier programme coming under increased scrutiny and highlighted as a candidate for cancellation. The solution adopted was, instead of outright cancellation, to delay, reduce or temporarily cancel programmes: the

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[32] Lord Guthrie's tenure as CDS included Britain's military intervention in Sierra Leone in 2000, Operation *Palliser*, a particularly notable and successful example of the maritime contribution to joint operations. For an overview of the British intervention in Sierra Leone, see Andrew Dorman, 'The British Experience of Low-Intensity Conflict in Sierra Leone', *Defense and Security Analysis*, Vol.23, No.2 (June 2007), pp.185-200.
[33] Interview with Admiral Sir Jonathon Band.
[34] Interview with retired senior military officer.
[35] Ibid.
[36] General Sir Mike Jackson, *Soldier: The Autobiography* (London: Bantam Press, 2007), p.346.

carrier programme was delayed (the in-service dates for *Queen Elizabeth* and *Prince of Wales* were moved back from 2014 and 2016 to 2015 and 2018 respectively)[37]; the Future Lynx programme reduced; and the FRES utility vehicle cancelled.[38] This was in order to offset a £2 billion deficit for 2008/9.[39] As Nick Childs explains with regard to the carrier programme, the implication of this delay was to significantly increase cost in the long-term: 'While achieving short-term savings thought to be around £450 million, it was estimated in 2009 that the net effect would be to increase the final cost of the programme by more than £900 million. In 2010 that estimate was revised upwards to £1.56 billion'.[40] The delay was achieved by delaying construction of the *Prince of Wales* by 18 months; this meant that instead of taking six years to build, the ship would take nine or ten years.[41]

As noted above, the cost of the carrier programme, and its implications for wider investment in defence capabilities was subject to scrutiny in the SDSR. Moreover, the rationale for the carriers was questioned. This reflected a debate led by the Army on the evolving character of conflict and the extent to which investment in high-end capabilities was necessary, especially in light of the continuing campaign in Afghanistan. This debate and its implications for the perceived strategic utility of maritime power will now be discussed, before considering the SDSR and the carrier debate.

The Army Perspective and Its Implications

The Army's perspective on the evolving character of conflict and Britain's strategic requirements were notably elucidated by the then Chief of the General Staff, General Sir Richard (now Lord) Dannatt and his successor, General Sir David (now Lord) Richards (CGS 2009-2010 and Chief of the Defence Staff, October 2010-July 2013). The view articulated by Generals Dannatt and Richards focused on a generic future conflict and a 'single version of war';[42] General Dannatt explained thus: 'We can no longer be prescriptive about taking part in

[37] Nick Childs, *Britain's Future Navy* (Barnsley: Pen and Sword Maritime, 2012), p.75
[38] Cornish and Dorman, 'Blair's Wars', p.258.
[39] Ibid.
[40] Childs, p.75.
[41] Interview with Admiral Sir Jonathon Band.
[42] Strachan, p.22.

either Major Combat Operations [MCO] or Stabilisation Operations, the boundary between them has become increasingly blurred – the antithesis of the beloved binary response'.[43] The implication for defence policy was as Dannatt explained:

> In a break from traditional defence planning, we would like to see planning go from today as the start point and work forward. This may seem slightly at odds with current practice, but we must be flexible enough to take account of shifting current operations and to veer and haul our capabilities and resources accordingly. *We must get away from blue skies thinking and from programmes that take a generation to introduce – current pressures do not give us that luxury*.[44]

The implication, and central to Dannatt's argument, was the requirement for a larger Army, and one optimised for conducting stabilisation operations:

> … The Army of tomorrow must retain the capability to fight MCO or Stability Ops, both simultaneously and sequentially. We have reached the point now where the most likely operations are amongst the most demanding. Our operations in Afghanistan and Iraq have clearly demonstrated that even with integrated technology and systems, the mass and footprint given by numbers are an essential element of the future Army – in other words we cannot get any smaller and I would argue strongly that we need to be bigger…. Therefore – and this is key to what I am saying – we must continue to optimise for the most likely – which is Stabilisation Operations – whilst maintaining our ability to dual role and meet the demand of Major Combat Operations …[45]

General The Lord Richards further developed the case for a unitary vision of war:

> But if I am right and non-state opponents should be our principal defence and security focus, inconveniently we cannot dismiss the possibility of state on state warfare either. What would such warfare actually look like? ... If countries like Russia or China really want to cause us major problems surely they will employ other levers of state power: economic and information effects, for example? … Attacks are likely to be delivered semi-anonymously through cyberspace or the use of guerrillas or proxies ... In other words, what I am suggesting, is that there is a good case for believing that even state on state warfare will be similar to that we will be conducting against non-state groupings.[46]

The implications of this vision are summarised by Professor Sir Hew Strachan: 'The unitary view of war is land-centric. It sees airpower in terms of attack helicopters, air mobility and strategic lift, not fast jets; it sees seapower in terms of

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[43] General Sir Richard Dannatt, 'The Land Environment – Moving Toward 2018', RUSI Future Land Warfare Conference, 12 June 2008 (transcript available via https://www.rusi.org/downloads/assets/Dannatspeech2008.pdf), p.4. Emphasis in original
[44] Ibid., p.5.
[45] Ibid., pp.5 and 8. Emphasis in original.
[46] 'CGS General Sir David Richards in his own words', RUSI Analysis, 26 Aug 2009, https://www.rusi.org/analysis/commentary/ref:C4A952992C52DF/#.U7rfw1bd71r. Accessed 7 July 2014.

logistic support, brown-water operations and coastal protection, not aircraft carriers'.[47] In essence, this vision is a contemporary version of the 'Continental Commitment', which instead of being focused on Europe, foresees a British commitment to enduring, large-scale ground stabilisation and post-conflict reconstruction operations in a similar vein to that concluded in Iraq and (at the time of writing, July 2014) on-going in Afghanistan.[48] Lord Richards points to this in his remarks:

> In people focused conflict, whether in Afghanistan or protecting vital sea lanes, delivering success will often need mass, whether it is the right number of troops and support helicopters, sufficient UAVs or sufficient *small ships*…in wars amongst the people, if you are using a lot of firepower - often delivered from the air in extremis as a result of insufficient manpower - you are almost certainly losing. One must have enough troops firstly to retain the tactical initiative and, secondly, to provide the enduring routine security without which the population will not have the confidence to reject the insurgent or spoiler.[49]

This vision of future conflict and its implications for the Royal Navy and Royal Air Force, described by Cornish and Dorman as essentially making them 'support commands to the Army',[50] did in the lead-up to the SDSR serve to facilitate some renewed Royal Navy-Royal Air Force cooperation, after the particularly heated Harrier debate of late 2008/early 2009 (see pages 188-189), in order to counter the Army's case.[51] However, although the Army's case for a long-term shift in defence policy toward stabilisation operations did not gain traction, the short-term requirements of Afghanistan exerted a substantial influence on the SDSR. This had a concomitant effect on the perception of the relevance of maritime capabilities to Britain's overall defence needs and thus the force structure mandated by the review.

The SDSR, The Carrier Debate and British Defence Policy

Before discussing the SDSR in connection with the carrier debate, the wider perceived strategic utility of maritime forces, and the extent to which British national and defence policy are founded upon a clear conception of long-term

[47] Strachan, p.22.
[48] For a dated but nonetheless still useful account of the 'Continental Commitment', see Michael Howard, *The Continental Commitment: The Dilemma of British Defence Policy in the Era of the Two World Wars* (London: The Ashfield Press, 1989).
[49] 'CGS General Sir David Richards'. Emphasis added.
[50] Cornish and Dorman, 'Blair's Wars', p.255.
[51] Interview with Professor Philip Sabin, London, 13 May 2014.

requirements, it is valuable to set out the context in which the review was undertaken.[52] This was dominated at the grand strategic level by, first, the economic recession resulting from the 2008 financial crisis and its impact on already strained government finances, and second, the creation of the Conservative/Liberal Democrat coalition government in May 2010. The political context for the SDSR was particularly complex, as Cornish and Dorman explain:

> There was also rivalry between leading political figures and between departments of government. On occasion it appeared that civilian and military cultures and perspectives rivalled each other within government. And there were, finally, rivalries and tensions within the leading party of government (the Conservative Party) and between the Conservatives and their coalition allies the Liberal Democrats.[53]

The SDSR itself was formulated by the Cabinet Office (due to it being a defence *and* security review), not the Ministry of Defence, and was driven by a combination of financial and political pressures with strategy determined by the short-term requirements of operations in Afghanistan.[54] The government-wide austerity measures introduced by the coalition government resulted in the defence budget enduring a cut of 8 per cent in real terms until 2014, with a de facto further cut of 8-10 per cent arising through the MoD having to resolve the problem of unfunded commitments in full.[55] Michael Codner, Senior Research Fellow in Military Sciences at the Royal United Services Institute (RUSI), has described the SDSR as maintaining the expeditionary approach set out in the SDR, stating that:

> …Britain does indeed have a military strategy. This strategy explains how an expeditionary Joint Rapid Reaction Force (in SDR language) with its land, naval and air components is intended to make the UK a safer place for its people through operations of choice overseas... The SDSR continues and reinforces this approach. It has not changed it or come to different conclusions.[56]

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[52] For discussion of the SDSR, and linked National Security Strategy, see, for example, Paul Cornish and Andrew M. Dorman, 'Dr Fox and the Philosopher's Stone: the Alchemy of National Defence in the Age of Austerity', *International Affairs*, Vol.87, No.2 (March 2011), pp.335-353; and 'Smart Muddling Through: Rethinking UK National Strategy Beyond Afghanistan', *International Affairs*, Vol.88, No.2 (March 2012), pp.213-222; and Matthew Savill, 'UK Security Strategy: Clarity or Compromise?', *Defence Studies*, Vol.11, No.3 (September 2011), pp.359-395.
[53] Paul Cornish and Andrew M. Dorman, 'Dr Fox and the Philosopher's Stone: the Alchemy of National Defence in the Age of Austerity', *International Affairs*, Vol.87, No.2 (March 2011), pp.335-353.
[54] Interview with retired senior military officer.
[55] Cornish and Dorman, 'Dr Fox and the Philosopher's Stone', p.341.
[56] Michael Codner, 'A Force for Honour? UK Military Strategic Options', in Michael Codner and Michael Clarke (eds.), *A Question of Security: The British Defence Review in an Age of Austerity* (London: I. B. Tauris, 2011), pp.153-173, quotation, pp.153-154.

However, in terms of execution, as Matthew Savill, a Civil Servant and graduate of the Advanced Command and Staff Course,[57] has suggested, '…the SDSR has resulted in what has been called an "eccentric force structure", especially in relative investment in enablers and the overall mix of capabilities'.[58] Savill also suggests that, in part, this is due to the services seeking '… to concentrate on the core capabilities they wish to retain, rather than those that they are required to in order to maintain a coherent force'.[59] Professor Michael Clarke, Director General of RUSI, has, in this light, questioned the opportunity cost of the carrier programme, stating that the: '… the Navy is sacrificing a lot of "flexibility", "adaptability" and other desirable aspects described in the National Security Strategy in giving up useful frigates and destroyers to pay for the carriers'.[60]

The carrier programme was subject to intense debate in the SDSR, as described by Danny Alexander, Chief Secretary to the Treasury:

> These issues [the defence budget as a whole], particularly the issues around the carriers, consumed a significant amount of time in our discussions about the defence settlement that took place in the National Security Council, and a significant amount of time in the conversations between me and my ministerial colleagues in the Ministry of Defence and at official level, and in conversations between No 10 and the Ministry of Defence.[61]

The debate on the carriers was hugely constrained and focused on whether to spend around £5 billion on two aircraft carriers or none.[62] Ian King, Chief Executive of BAE Systems, articulated the cost of only acquiring *Queen Elizabeth* in a letter to the Prime Minister:

> If both carriers are completed the cost will be £5.25bn [sic]. If Prince of Wales is cancelled, the direct cost of the programme will be £4.8bn [sic]. However, in these circumstances, and under Treasury rules and the agreements I have

[57] For an overview of the Advanced Command and Staff Course, see http://www.da.mod.uk/colleges/jscsc/acsc/about-acsc. Accessed 10 July 2014.
[58] Matthew Savill, 'UK Security Strategy: Clarity or Compromise?' *Defence Studies*, Vol.11, No.3 (September 2011), pp.359-395.
[59] Ibid., p.376.
[60] Michael Clarke, 'Has the Defence Review secured Britain's place in the world?' RUSI Analysis, 20 Oct 2010, https://www.rusi.org/go.php?structureID=commentary&ref=C4CBE880DC8385#.U75yulbd71o. Accessed 10 July 2014.
[61] 'Wednesday 3 November 2010: Examination of Witnesses' (Ev 86) in House of Commons Treasury Committee, *Spending Review 2010,* Sixth Report of Session 2010-11, Vol. II, HC 544-II (London: The Stationery Office, 2010), p.90.
[62] I am grateful to a senior retired military officer and a senior industrial official for this insight.

> outlined, there will be consequential costs, including those related to rationalisation, which we estimate would amount to £690m [sic].[63]

Moreover, the industrial implications of cancelling *Prince of Wales* would be substantial, as King explained:

> The cancellation of Prince of Wales would mean that production in all BAE Systems shipyards would cease at the end of 2012. There is no further production work planned until steel is due to be cut on the new frigate programme in 2016. This means that the business would be unsustainable, and all three yards would have to close by early 2013, with the loss of more than 5,000 jobs in BAE Systems and many more across the UK in hundreds of companies in the supply chain. In practice, that means the end of the UK's capability in complex warships, and would bring the sector to a halt. Significant additional rationalisation costs would also result for MOD, the BAE Systems element alone of which would be £250m [sic]. And a potential termination liability under our agreement with MOD would also arise.[64]

Even accounting for measures to ameliorate the impact of the cancellation of *Prince of Wales*, such as accelerated production of the replacement frigate programme, the implications for the shipbuilding sector would still be significant:

> So, in practical terms, and even after the potential amelioration, the cancellation of Prince of Wales would cause the abrupt rationalisation of the industry over the next 2-3 years, which will precipitate the closure of at least one of the BAE Systems shipyards, and the layoff of production staffs at the others. We anticipate that this will require at least 2,500 job losses in BAE Systems in Scotland and on the South Coast of England, as well as several thousands in the wider supply chain.[65]

In military terms, the rationale for the CVF programme set out in the SDR, emphasising the provision of offensive airpower, had lost traction by the late 2000s due to the campaigns in Iraq and Afghanistan (despite the vital contribution of carrier-based airpower, in particular to operations in Afghanistan).[66] Arguments for the carriers in the SDSR emphasised the flexibility of the ships, in particular with regard to their roles supporting amphibious and helicopter operations.[67] Further, in contrast to the SDR, which, as discussed in chapter five (see pages 179-180) did not consider an LHD, had the UK been starting the carrier replacement programme in 2010, the LHD option, rather than a traditional aircraft

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[63] 'Letter from the Chief Executive of BAE Systems to the Prime Minister' (Appendix 1) in House of Commons Treasury Committee, *Spending Review 2010,* Sixth Report of Session 2010-11, Vol. I, HC 544-I (London: The Stationery Office, 2010), p.51.
[64] Ibid.
[65] Ibid., p.52.
[66] Interview with retired senior military officer.
[67] Ibid.

carrier, would have been pursued.[68] This is reflected in the shift to the new concept of Carrier Enabled Power Projection, as explained by the National Audit Office (NAO):

> Following the SDSR decision the Department has been developing its thinking about how it will utilise the operational carrier and the aircraft to best effect. Its emerging thinking, building on some pre-SDSR work is called Carrier Enabled Power Projection (CEPP). As part of CEPP, the role of Carrier Strike was expanded from predominantly focusing on fast jets to "support a broad range of operations including landing a Royal Marines Commando group, or Special Forces squadron, assisting with humanitarian crises or the evacuation of UK Nationals".[69]

The NAO also explained the wider rationale for the SDSR's eventual carrier policy:

> The Senior Judgement Panel had concluded that Carrier Strike supported the Adaptable Britain posture; however, in the event of a serious cut in funding it would be prioritised below other capabilities such as amphibious operations and naval constabulary. This was based on its view of the United Kingdom's requirements over the next decade for Future Force 2020. In September 2010, the Department's assumption was that the likely reduction in its funding would be twice as great as the 7.5 per cent reduction financially agreed. Working within this funding contraint [sic], the Defence Strategy Group agreed, that cancelling both carriers was the preferred military option rather than eliminating amphibious capabilities or making significant further reductions in destroyers or frigates and asked that the National Security Council be notified of this position. The Group acknowledged that this might be unacceptable to the National Security Council as cancelling both carriers would give rise to considerable costs in the early years and would result in the collapse of the United Kingdom warship-building industry. It therefore recommended the construction of both carriers with one being operational and one in extended readiness.[70]

The Senior Judgement Panel referred to in the above quotation was an ad hoc group of one and two star level subject matter experts in the MoD that met to support the Vice Chief of the Defence Staff (General Sir Nicholas Houghton, now Chief of the Defence Staff) in assessing the military significance, and thereby ranking of proposed savings measures. The results of those deliberations formed part of the evidence brought to higher decision-making bodies. However, the final shape of the SDSR was determined by the Cabinet Office, thus reducing the impact of the Senior Judgement Panel.[71] The cancellation of the carrier programme, in addition to the above-described economic impact, would have

[68] Ibid.
[69] NAO, *Carrier Strike*, p.32, paras 3.5-3.6.
[70] Ibid., p.28, para, 2.23.
[71] I am grateful to a retired senior military officer for this insight regarding the Senior Judgement Panel.

resulted in a fundamentally different power projection capability, and the Royal Navy ceasing to be a full spectrum navy (the only other full spectrum navies are the US, Russian, French and Chinese navies).[72] This would also have had a concomitant effect on Britain's international influence and credibility.

i. The Carrier Debate and the Strategic Utility of Maritime Forces

The decision to retain the carriers was most likely based primarily on the economic effects of cancellation and the follow-on political implications resulting from the collapse of the warship-building industry, rather than an appreciation of the strategic utility of aircraft carriers. This is not surprising, especially, in light of the preceding analysis, considering the impact of Iraq and even more, Afghanistan on British defence policy. Those campaigns have also contributed to the perceived diminished urgency of the naval case.[73] This has been compounded by a sea blind nation and politicians lacking an essential understanding of maritime matters.[74] This is reflected in the SDSR, which in addition to the above-described debate on whether to procure the *Queen Elizabeth*-class, also significantly reduced the scale of Britain's amphibious capability.[75] Further, despite it being agreed during the SDSR process that 23 destroyers and frigates were required,[76] the size of the escort force was reduced from 23 to 19. It does warrant highlighting that the SDSR, despite withdrawing from service HMS *Ark Royal* and the Harrier force and committing to only operating one of the *Queen Elizabeth*-class carriers, did reiterate the rationale for carrier airpower,[77] albeit whilst accepting a capability gap.

Significantly, the SDSR encapsulated an approach which focuses 'on preventing conflicts and building local capacity to deal with problems [and] maintains a broad spectrum of defence and other capabilities, able to deter and contain, as well as engage on the ground, developing threats'.[78] This approach is one for which

[72] Interview with retired senior military officer.
[73] Interview with Admiral Sir Jonathon Band.
[74] Ibid.
[75] HM Government, *SDSR*, p.22.
[76] Interview with retired senior military officer.
[77] HM Government, *SDSR*, p.23.
[78] Ibid., p.10.

maritime forces are particularly suited,[79] and although the SDSR itself was constrained by the short-term requirements of Afghanistan and the overarching economic circumstances, both the then Secretary of State for Defence (Dr Liam Fox) and his immediate successor (Philip Hammond) recognised the naval case.[80] The conclusion of operations in Afghanistan by the end of 2014 and the return to a contingency posture for the Armed Forces, in conjunction with the aforementioned focus on conflict prevention, may thus provide a more favourable context for the articulation of the strategic utility of maritime forces, and more importantly, for its acknowledgement by policy-makers. Further, as will be discussed below, both Army and Royal Air Force conceptual and doctrinal documents highlight the contribution of the maritime environment to the land and air domains respectively, illustrating the potential benefits of a maritime-enabled approach to Britain's expeditionary posture.

ii. National Policy and Defence Planning: Lessons from the Carrier Debate?

The above discussion of the countervailing influences and their impact on the carrier debate and wider perceived strategic utility of maritime forces, has highlighted a recurring theme in British defence policy especially from 2003 onward: that of short-termism. Moreover, the arguments over whether the campaigns in Iraq and Afghanistan reflected a fundamentally new paradigm in conflict, necessitating a change in national policy and defence planning, or a current and pressing challenge but not one requiring a shift in long-term strategic direction, has contributed to a debate on the role of national strategy in the UK.[81]

Of particular significance has been the increasing resource and budgetary pressures serving as a growing constraint on the MoD, and as discussed above, resulting in short-term savings measures being pursued which have had the effect of increasing costs in the long-term: the CVF programme is a notable example in this regard. The problem of short-termism and the issue of an overarching national

[79] For example, see Corbett Centre for Maritime Policy Studies, *How Navies Prevent Conflict* (2009).
[80] Interview with retired senior military officer.
[81] For example, see the series of articles by Paul Cornish and Andrew Dorman on British national strategy in *International Affairs*: 'Blair's Wars and Brown's Budgets'; 'National Defence in the Age of Austerity', *International Affairs*, Vol.85, No. 4 (July 2009), pp.733-753; 'Breaking the Mould: the United Kingdom Strategic Defence Review 2010', *International Affairs*, Vol.86, No.2 (March 2010), pp.395-410; 'Dr Fox and the Philosopher's Stone'; and 'Smart Muddling Through'.

policy vision (or lack of) is subject to much debate. Codner explains the contention thus:

> The argument was well made by Sir John Coles, a former permanent under-secretary of state at the Foreign and Commonwealth Office. He suggests that the so-called pragmatic British official approach is to create policy that is devoid of a vision of the future, and without any overarching long-term objectives. For British policy-makers, existing policy, such as it is, must form the basis for long-term planning. As this policy is adjusted to meet changing circumstances, long-term plans can be similarly adjusted.[82]

The implications of the lack of an overarching national policy are discussed by Lieutenant General Paul Newton, Air Vice-Marshal Paul Colley and Brigadier Andrew Sharpe:

> The UK competes for position, power and resources within an international system, but unlike some – such as Al Qa'ida, China and Iran – its policies are more often driven by near-term expediencies (not least, the democratic electoral cycle). Yet, lacking a detailed and enduring 'grand strategic manifesto', those many departments of state with responsibilities for security are arguably neither sufficiently adaptive to events nor agile enough in their responses. Furthermore, we have let slip both the mechanisms and more importantly the grammar with which to conduct the relevant strategic discourse within and around defence. This imbalance is exacerbated by a sense that we are 'at war in a time of peace', yet despite the intensity of current combat, the reality is one of limited conflict. If we are failing to deliver strategy due to 'intellectual decay', then the implications would extend well beyond the Ministry of Defence, to Whitehall's machinery and culture. The issue would thus be both intellectual and institutional.[83]

In defence policy terms, the result is, as explained by Vice Admiral Sir Jeremy Blackham, that:

> Serious strategic policy making is trumped by expediency. Budgets trump military credibility; and so we are at risk of being trumped by events. In Britain today 'defence policy' appears to be merely to have a nuclear deterrent and then buy whatever else can be afforded, with no informed consideration of how the whole strategy fits together.[84]

The implications for the Armed Forces are, as Cornish and Dorman explain:

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[82] Codner, 'A Force for Honour?', p.153.

[83] Paul Newton, Paul Colley and Andrew Sharpe, 'Reclaiming the Art of British Strategic Thinking', *RUSI Journal*, Vol.155, No.1 (February/March 2010), pp.44-51. The authors were respectively Commander Force Development Training, HQ Land Forces; Assistant Chief of the Defence Staff (Development, Concepts and Doctrine); and Head of Land and Research at the Developments, Concepts and Doctrine Centre.

[84] Vice Admiral Sir Jeremy Blackham, 'Deterrence is Not Just About Nuclear Weapons: Time for Serious Strategic Thought', A UKNDA Commentary, 12 August 2013, http://uknda.org/File/Formal%20Documents/UKNDA%20Commentary%20-%20August%202013%20(web)%20(1).pdf.

> … The MOD could continue with the traditional, incremental approach of muddling through while Britain's armed forces decline both relatively and absolutely at an ever faster rate. The appeal of such an approach is that it is in many ways the easiest option, since it largely obviates the need to make major decisions. The problem is that it leads to perpetual short-termism in decision-making, and in the medium term produces suboptimal results (the delays to the aircraft carrier programme and its associated aircraft are a prime example of this). This inevitably results in capability degradation at a higher and higher rate, major programming inefficiencies (as we have seen over the last few years) and a major disconnect between ends, ways and means.[85]

It also warrants emphasising that the carrier programme can be cited as an example for planning for the mid-to-long term. As discussed in chapter three (see pages 122-123), the decision to seek a joint land and sea-based single platform solution to Britain's requirement for a fifth generation offensive air system, with the *Queen Elizabeth*-class carriers providing an additional 'airfield option', was a pragmatic and sensible means of acquiring a high-end yet high-cost capability. Further, due to the industrial importance of the carrier programme, it served as a key driver for the ToBA, a notable example of an attempt to develop a long-term policy linking a sustainable industrial base with naval strategic requirements.

At its most fundamental level, the debate on the CVF programme is a facet of the enduring debate over what role in the world Britain sees itself having and thus what armed forces Britain perceives it requires. The SDSR states that Britain should work 'to shape a stable world, by acting to reduce the likelihood of risks affecting the UK or our interests overseas, and applying our instruments of power and influence to shape the global environment and tackle potential risks at source'.[86] That is, Britain continues to aspire to a major role in world affairs and thus requires a commensurate level of military capability. The *Queen Elizabeth*-class aircraft carriers, as both the SDR and SDSR pointed out, will provide a significant contribution to the role Britain sees itself having, and as the previous chapters have discussed, without the constraints imposed by a dependence on gaining access, basing and overflight rights. The value of the carriers, as has been noted previously in this thesis, is a reflection of the wider utility of maritime forces, enabled by the ability to utilise the global commons of the sea. As will be discussed below, a maritime-based expeditionary posture is arguably a cost-

[85] Cornish and Dorman, 'Dr Fox and the Philosopher's Stone', pp.348-349.
[86] HM Government, *SDSR*, p.9.

effective means of leveraging Her Majesty's Armed Forces as a whole in order to achieve Britain's national policy aims.

As the UK approaches the conclusion of operations in Afghanistan, and with it more than a decade of continental garrisoning operations in that country and Iraq, whilst at the same time responding to sustained economic challenges and a strategic system in flux, the question of the resources available for defence and the balance between the Armed Forces will become increasingly pressing. It is to this subject that the chapter now turns, and in particular, the question of whether Britain requires a Maritime Strategy.

Assessing a British Maritime Strategy: Rationale, Implications and Debate

The purpose of this section is to examine the rationale for, the utility and implications of a potential British Maritime Strategy and the circumstances under which such a strategy may be adopted. At the centre of the analysis is the question: why a Maritime Strategy? In order to answer this question, the analysis first considers Britain's strategic context and interests, plus the evolving character of the international system. This provides the basis for assessing the need for a maritime strategy, the requirements of such a strategy and the implications for British force development and structure, including in particular, the role of the Royal Marines and Fleet Air Arm. The Royal Marines and FAA are of significance as they are examples of forces that have a cross-domain capability, that is, the ability to operate effectively across the physical environments (air, land and sea). In this context, it refers specifically to the ability to operate proficiently from the maritime environment into the land or air environments, utilising amphibious capabilities or carrier basing. It also contributes to a core tenet of the analysis; a *maritime* strategy should not be confused with a *naval* strategy. A maritime strategy would seek to coordinate the aggregate capabilities of Her Majesty's Armed Forces on a joint basis, exploiting Britain's position as an insular maritime state and the attributes of the maritime environment as an enabling capability (combined with the cross-domain capabilities of the Royal

Marines and Fleet Air Arm) to underpin an agile expeditionary approach to operations.

The British Strategic Context

The defining feature of Britain's strategic context is geographic, that is, Britain's position as an island. Professor Colin Gray described the British position in the following terms:

> Britain is a maritime medium power whose security and prosperity requires unimpeded maritime access and transit. As a maritime trading country, Britain requires good order at sea. Britain's maritime geography, indeed insularity, mandates primary economic and strategic significance for the country's ability to use the seas. This is not discretionary. It is not an open issue for policy choice. The geopolitical, hence geostrategic, context for British security is both global and (broadly) Atlantic. It is not narrowly European.[87]

The significance of Britain's position as a trading nation is summarised by Professor Geoffrey Till:

> For us the bottom line (an appropriately economic phrase) is about defending our trading interests; for Britain is, and has been for the past several hundred years, primarily a trading nation. We are heavily engaged in the processes of globalisation. After New York, London is the second most globalised capital in the world. Ten per cent of our GDP derives from our international financial services; 60 to 70 per cent of the profits of UK listed companies are actually earned overseas. Nearly one in ten British people live part or all of the year abroad while over four million foreign nationals live in the UK. A very high proportion of our GDP derives from international trade. According to the A.T Kearney/Foreign Policy Globalisation Index, the UK is the 12th most engaged country in the world economy. If one excludes the factors that disproportionately skew the calculations towards countries with a very small population, like Singapore or New Zealand, the UK rises to third position behind only the United States and Canada.[88]

Further, as Till explains: 'Whether we like it or not, we are part of a global trading system. What happens in distant parts of the world, sooner or later affects us here, and often to a much greater extent than it does most other countries.'[89] Till defines three types of threat to the international trading system, which require 'a policy of defending trade and the conditions for trade':

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[87] Colin Gray, 'Britain's National Security: Compulsion and Discretion', *RUSI Journal*, Vol.153, No.6 (December 2008), pp.12-18, quotation, p.15.
[88] Geoffrey Till, 'Back to Basics: British Strategy After Afghanistan', *Corbett Paper No. 6* (Corbett Centre for Maritime Policy Studies, July 2011), p.5.
[89] Ibid.

> Disorder *ashore and at sea*, especially in areas that produce crucial commodities, through which critical transportation routes run or which have clear links to British security and/or prosperity. Inter-state war. The disruptions to the world economy that a US-China conflict over Taiwan would have are unimaginable. The threats of this are currently low, but we need to help keep them so. Deliberate attack by forces, both state and non-state, hostile to the intentions, values and outcomes of globalisation.[90]

The implications for British military strategy are, according to Till:

> Given the difficulties of identifying the bearable costs of kinetic intervention… it is worth making the point that one thing we can be sure of is that preventing conflicts is much cheaper and much better than winning them when they happen and then engaging in long-term repair work afterwards. This suggests that a proactive rather than reactive national policy or conflict prevention and deterrence is and should remain at the heart of our national efforts to defend the system from which we derive so much benefit, at least to the extent that our resources allow.[91]

It warrants emphasising that, due to its dependence on the global trading system, Britain does not have one specific regional focus. In this regard, Till suggests that: '…we need to focus our national attention and our national resources on the places that matter, the Gulf (resources), the Far East (trade) and Africa (resources) not on places that sadly don't'.[92] The sources of British energy imports illustrate the geographic scope of Britain's trade-based interests. The top three sources of coal/solid fuel imports are Russia (38 per cent), Columbia (25 per cent) and the US (19 per cent); crude oil is primarily sourced from Norway (67 per cent), Russia (8 per cent), Nigeria (7 per cent) and Algeria (5 per cent); whilst gas is mainly imported from Norway via pipeline (in 2011, 41 per cent), liquefied natural gas (LNG) imports are of increasing significance. In 2011, LNG imports from Qatar equalled 40 per cent of total UK gas imports.[93] This is represented tangibly by an LNG tanker every 300 miles between the UK and Qatar and highlights the significance of energy security to wider strategic considerations.[94]

Britain also has a diverse range of territorial interests – the Overseas Territories - in the Mediterranean, Caribbean, South Atlantic, Indian Ocean and Pacific and alliance obligations, including in the Far East – the Five Powers Defence

[90] Ibid., p.6. Emphasis added.
[91] Ibid., pp.6-7. The SDSR notably advocated this approach. HM Government, *SDSR*, p.10.
[92] Ibid., p.10
[93] All figures are from 2011. Paul Bolton, 'Energy Imports and Exports', Standard Note SN/SG/4046 (House of Commons Library, 4 March 2013), pp.7-8.
[94] Interview with retired senior military officer.

Arrangements (FPDA). The FPDA, comprising Australia, Britain, Malaysia, New Zealand and Singapore, reflects the confluence of Britain's diplomatic, trading, military and historical interests; aside from Britain, the FPDA comprises former British colonies or dominions, and members of the Commonwealth – an oft-overlooked instrument of soft power[95] – with the purpose of consulting in the event of a direct threat to either Malaysia or Singapore.[96] Of most significance, particularly for this analysis, is the regional context for the FPDA: the 'Asian Meridian'. This region, defined by the Development, Concepts and Doctrine Centre (DCDC) as:

> …The region from Hong Kong in the North, through South East Asia into Australia…. The region sits astride the global trade routes of the Malacca and Lombok Straits through which 20% of global oil production is transported, including 80% of China's oil imports. Over 60% of global shipping travelling through these choke-points is destined for Chinese ports. Similarly, Japan imports over 80% of her energy needs along these routes.[97]

Thus, although the Asian Meridian may seem, at first glance, to be at such distance from Britain as not to constitute an area of high strategic importance, it warrants particular attention and recognition as a major British area of interest. This is because of Britain's historic links to the region, the presence of Commonwealth allies, but especially due to the region's considerable and growing importance to the global trading system. The region is also of significant economic importance to the UK. Based on figures in the Organisation for Economic Co-operation and Development's *Monthly Statistics of International Trade*,[98] British imports from the FPDA members in 2012 totalled $1.130 billion; with imports from China, Hong Kong, Japan and South Korea added, the total increased to $7.502 billion. British exports to the FPDA members were worth $1.411 billion; and with the addition of China, Hong Kong, Japan and South Korea, $4.581 billion. These data illustrate the importance of the Far East for British trade. The region, if it were a single state, would be one of Britain's largest trading partners, exceeding the value of British imports from Germany ($6.839 billion) and the US ($4.143 billion) and the value of exports to Germany and the

[95] For example, See Till, 'Back to Basics', pp.13-14.
[96] Ministry of Defence/DCDC, *Strategic Trends Programme: Global Strategic Trends – Out to 2040* (Fourth Edition, 2010), p.64, footnote 92.
[97] Ibid., p.64.
[98] OECD, *Monthly Statistics of International Trade*, Vol.2013, No.7 (July 2013), pp.112-113.

US, worth respectively, $4.315 billion and $5.314 billion.

The preceding analysis should not be perceived as suggesting Europe holds no strategic significance for Britain. Germany is the UK's largest source of imports, with the Netherlands and France third and fifth respectively (China is fourth). Norway, in addition to being a major source of energy, is also Britain's sixth largest source of imports; the largest UK export market is the United States, with Germany, the Netherlands and France, second, third and fourth respectively.[99] However, it does indicate the extent to which Britain's interests are, as emphasised by Gray and Till, global, and dependent on the effective functioning of the international maritime trading system.

The military implication of this dependence is, as Till emphasises, the requirement for British defence policy to be based on the defence of, and conditions for trade. This should not be taken as requiring Britain to possess the ability to single-handedly defend the entire international trading system, nor that 'defence of trade' is equivalent to a large-scale Battle of the Atlantic-style campaign. Rather, it points to the need for Britain to be capable of responding in an agile and flexible manner, either unilaterally or in coalition, to potential threats, including at source, to those areas 'through which critical transportation routes run or which have clear links to British security and/or prosperity'. More broadly, it requires an ability to project military power in order, with allies and partners, to help to shape the international system. Forward deployed, credible maritime forces can particularly contribute to this aim through upstream conflict prevention, and where intervention is necessary, engagement without embroilment.[100] The analysis will now turn to evaluate the evolving strategic environment and the character of the potential threats and challenges to the international trading system that are most relevant to the defence of British interests.

The Evolving Strategic Environment

The international system is in a period of flux, marked particularly by the (re) emergence of great powers, in particular China and Russia, and to a lesser extent

[99] Based on data in ibid.
[100] Interview with retired senior military officer.

and in the longer-term, India and Brazil, combined with a *relative* decline in the overall position of the US (the long-term impact of the US budgetary sequestration process will be a particularly important factor in determining the extent of this decline)[101]. The implications of this shifting balance of power are described by DCDC:

> Out to 2040, the locus of global power *will* move away from the United States (US) and Europe towards Asia, as the global system shifts from a uni-polar towards a multi-polar distribution of power. This shift, coupled with the global challenges of climate change, resource scarcity and population growth, is *likely* to result in a period of instability in international relations, accompanied by the *possibility* of intense competition between major powers.[102]

The resurgence of Chinese and Russian power and influence may constitute a challenge to British interests. With respect to China, its increasing assertiveness, in particular with regard to territorial disputes in the South and East China Seas and its potential impact on British allies (Malaysia is one party to the Spratly Islands dispute in the South China Sea) and the international trading system, may warrant British concern.[103] The trajectory of Russian national policy and military strategy, especially with regard to its long-term rearmament plans and perspective toward European security, especially in light of the crisis in Ukraine, is another cause for concern.[104]

Hedging against a Russian or Chinese challenge represents the highest-end of the threat spectrum for which British strategy should be based. This is not to argue that a Russian or Chinese threat will emerge and directly threaten British interests, but that the possibility should be accounted for. For example, a resurgent Russia reinforces the requirement for broad-based capabilities and

[101] For an overview of potential long-term US force structure options, see 'Strategic Choices Exercise Outbrief [sic]', and Todd Harrison, *Comparison of Choices*, Center for Strategic and Budgetary Assessments, http://www.csbaonline.org/publications/2013/05/strategic-choices-exercise-outbrief/ and http://www.csbaonline.org/wp-content/uploads/2013/05/6-Comparison-of-Choices.pdf. Accessed 25 September 2013.
[102] DCDC, *Global Strategic Trends*, p.10. Emphasis original.
[103] For an overview of the South China Sea territorial disputes, see Sarah Raine and Christian Le Mière, *Regional Disorder: The South China Sea Disputes* (Abingdon: Routledge for the International Institute for Strategic Studies, 2013); for an overview of the evolving naval balance in the Far East, see Geoffrey Till, *Asia's Naval Expansion: An Arms Race in the Making?* (Abingdon: Routledge for the International Institute for Strategic Studies, 2012).
[104] For an overview of long-term Russian maritime force plans and ambitions, and their context within wider Russian military strategy and national policy, see James Bosbotinis, 'The Russian Federation Navy: An Assessment of its Strategic Setting, Doctrine and Prospects', *Special Series* (Research and Assessment Branch: The Defence Academy of the United Kingdom), 10/10, September 2010.

globally deployable, credible forces.[105] The DCDC 'Future Character of Conflict' (FCOC) paper does though state:

> Direct conflict between the UK and a major power such as China or Russia is judged unlikely. However, wars involving the major power or their proxies are probable. It is possible that the UK may be involved in a coalition action against a state actor possessing significant military capabilities, with the UK fighting in some cases from a position of near-parity or even relative disadvantage.[106]

In contrast to the focus on stabilisation and counter-insurgency of the first decade of the 21st century, it is likely that a prospective British strategy – whether maritime or not – will need to focus on higher-intensity conflict scenarios. This may include potentially operating in the face of 'Regional powers armed with precision-guided missiles and anti-access technologies, such as submarines and sophisticated surface-to-air missiles….', which '…*will* make traditional power projection strategies more costly'.[107] In addition, advanced fifth generation aircraft (those featuring extensive use of low observable technologies, internal weapons carriage and advanced sensor systems) such as the Russian Sukhoi T-50, Chinese Chengdu J-20 and Shenyang J-31, if exported (India is investing in the Russian T-50 programme), could, as Flight Lieutenant Kevin Terrett, RAF, explains:

> [An in-theatre VLO [very low observable] threat will] constitute a considerable challenge to any joint commander attempting to concurrently protect friendly strategic joint force concentrations and conduct an offensive joint action campaign. Additionally, the escalation in the potential for friendly losses may skew the balance of risk versus reward for our politicians, thereby limiting the influence that our nation is capable of bringing to bear.[108]

Moreover, the geopolitical context may be characterised by:

> … An unstable transition to a multi-polar world that allows old and new state rivalries to emerge; widespread global inequality that heightens associated grievances; population increases, resource scarcity and the adverse effects of climate change that combine to increase instability; and the increased importance of ideology.[109]

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[105] Interview with Admiral Sir Nigel Essenhigh.
[106] MoD/DCDC, 'Future Character of Conflict [FCOC]' (2010), p.30.
[107] DCDC, *Global Strategic Trends*, p.17. Emphasis original.
[108] Flight Lieutenant Kevin Terrett, 'Stalemate: How the Future of Air Power Might Look in the Shadow of the Emerging Fifth-Generation Air Threat', *Air Power Review*, Vol.15, No.2 (Summer 2012), pp.17-32, quotation, p.29.
[109] DCDC, *Global Strategic Trends*, p.15

In short, the combination of an increased military threat from potential adversaries, possibly backed or at least armed by a major power, and a less permissive geopolitical environment, may act as a significant constraint on the ability to secure access, basing and overflight (ABO) rights for expeditionary operations. Further, this may be compounded by an increasing hybrid threat:

> In future conflict smart adversaries will present us with hybrid threats (combining conventional, irregular and high-end asymmetric threats) in the same time and space. Conflict could involve a range of trans-national, state, group and individual participants who will concentrate and operate both globally and locally. In some conflicts, we are likely to see concurrent inter-communal violence, terrorism, insurgency, pervasive criminality and widespread disorder. Tactics, techniques and technologies will continue to converge as adversaries rapidly adapt to seek advantage and influence, including through economic, financial, legal and diplomatic means.[110]

This threat will require countering in a future operational environment that is likely to be, according to the FCOC, 'congested, cluttered, contested, connected and constrained'.[111] Of particular relevance to this analysis, is the 'congested' nature of the future battlespace:

> Historically, in a conventional context, the UK Armed Forces have usually sought to avoid congested battlespace when we were trying to achieve freedom of manoeuvre. While we will continue to seek to dictate the terms of battle to our adversaries, our choice in this regard will not be absolute…. In the future, we will be unable to avoid being drawn into operations in the urban and littoral regions where the majority of the World's population live and where political and economic activity is concentrated.[112]

The significance of, and the requirement to influence the littoral is emphasised when it is considered that:

> By 2020, over 80% of the world's population will live within 100 miles of the sea. At present 147 (over 75%) of member states of the UN, are coastal states. Most of these states have extended their jurisdiction out to sea, in many cases as far as 200 nautical miles or more. Most human maritime activity – shipping, fishing, hydrocarbon exploration etc – is currently conducted within a 300-mile zone. This means that a substantial proportion of the world's economic and political activity is being conducted in a narrow strip of land and sea (the littoral) on average no wider than 300 miles.[113]

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[110] DCDC, 'FCOC', p.13.
[111] See ibid., pp.21-25 for detailed analysis.
[112] Ibid., p.21.
[113] MoD/DCDC, 'Future "Black Swan" Class Sloop-of-War: A Group System' (Joint Concept Note 1/12, May 2012), p.1-3.

In addition, eight of the ten largest cities in the world are situated on the coast,[114] and there is a developing trend toward oceanic competition:

> The high seas, the deep ocean and the polar regions, as well as the airspace above, will become areas of increased competition as advanced technology, greater accessibility and growing resource pressures encourage more intensive exploitation by states and commercial interests. Competition will centre on fishing, deep sea mining and the extraction of oil and gas, and will extend to transportation and rights of passage.[115]

Responding to such an operational environment will, as the DCDC *Global Strategic Trends* paper suggests, require 'far-sighted and agile strategies'.[116] The FCOC paper describes the requirement thus:

> The West is now reacting to our adversaries' attacks, rather than setting the agenda; if we are to regain the initiative, and win, we will have to operate in a different asymmetric or hybrid manner that can give us an edge against our enemies. To do this we may have to adopt responses that may well be currently unfamiliar to us, and some we do not understand particularly well, for example: prevention, stabilisation and cyber-operations.[117]

Major General Buster Howes has suggested an approach to meeting the challenges of the prospective strategic environment and reconciling the British defence resources-capability dilemma in which 'we might move away from configuring fixed solutions to "certainties" and instead pursue an expeditionary path – in every sense – based around versatile forces that can react to the uncertain realities of our environment'.[118] This expeditionary approach would be maritime and:

> …. Rests on the training and retention of high-quality people, not through greatly increased spending or smarter technologies *per se*. It rests on soldiers – and Marines – who are intellectually supple, emotionally strong and physically resilient and who belong to organisations that are versatile and agile, and which can react and deploy where they may not be invited. Crucially, they can change the nature of events when they arrive.[119]

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[114] UN Atlas of the Oceans, 'Human Settlements on the Coast', http://www.oceansatlas.org/servlet/CDSServlet?status=ND0xODc3JjY9ZW4mMzM9KiYzNz1rb3M~. Accessed 25 September 2013.
[115] DCDC, 'Future "Black Swan" Class Sloop-of-War', p.1-4.
[116] DCDC, *Global Strategic Trends* p.70.
[117] DCDC, 'FCOC', p.13.
[118] Buster Howes, 'Vast Ills Follow a Belief in Certainty', *RUSI Journal*, Vol.156, No.3 (June/July 2011), pp.20-25, quotation, p.23. The article is based on Major General Howes' address to the 2011 Gallipoli Memorial Lecture; at that time he was Commandant General Royal Marines.
[119] Ibid., p.24.

In this respect, versatile, high-quality personnel who can operate with agility in response to emergent threats and challenges would provide the asymmetric edge necessary to gain the initiative against potential adversaries, without being dependent on ABO.[120] Moreover, as Major General Howes explains, a maritime approach would reflect continuity in British strategy and more importantly, contribute to the prevention of conflict:

> We have 500 years of experience of using the sea to our advantage. We already own the hardware to continue to do so. It can be projected forward without commitment and poise – if needs be, almost indefinitely, as a subtle and responsive instrument of coercion, conventional deterrence and force on mind. It can engage across the spectrum of interest, activity and conflict, ranging from building political trust and support through partnering, and from constabulary tasks to kinetic engagement.[121]

This quotation contains key elements of the argument for a maritime strategy; the chapter will now examine in detail the military utility and implications of such a strategy.

The Military Utility and Implications of a Maritime Strategy

From the preceding discussion, four major points emerge, which point to the potential utility of a Maritime Strategy for Britain. First, Britain is, relative to most other major economies, highly dependent on the global trading system for its prosperity and access to resources. Secondly, the international system itself is in a period of long-term transition with the potential for significant instability, the (re) emergence of major powers and rivalries and competition for – possibly leading to rivalry over – access to strategic resources. Third, and deriving from point two, the future operating environment is projected to be complex, congested and one in which traditional Western military supremacy is contested. This may include in some circumstances, British forces operating from a position of relative disadvantage, either due to the adversary employing hybrid means to constitute a complex threat, or via the backing of a major power that has provided advanced weapon systems that confer a technological edge (such as fifth-

[120] 'Agility' is a component of 'Flexibility' – a Principle of War – and is defined as 'the physical and structural ability that allows forces to adjust rapidly and decisively, especially when operating in complex situations or in the face of new or unforeseen circumstances'. Ministry of Defence/DCDC, *British Defence Doctrine* (Joint Doctrine Publication 0-01, 2011), p.2-7, para 213.
[121] Howes, 'Vast Ills Follow a Belief in Certainty', p.24.

generation combat aircraft). In such a context, gaining access to a theatre of operations may be difficult either due to the military threat, including the potential utilisation by an adversary of anti-access strategies, or politico-diplomatically (including as a possible result of the adversary's coercive influence). Fourth, Britain requires a 'far-sighted and agile strategy' and versatile armed forces capable of operating across the spectrum of conflict and gaining access to 'where they may not be invited'. This is in order to respond effectively to the evolving strategic environment and increasingly adaptive, and potentially well-equipped future threats, and most importantly, defend trade and the conditions for trade (especially vis-à-vis regional powers who may seek to disrupt or threaten to disrupt, for example, regional resource markets, in order to coerce or deter Western support for regional allies).

The latter requirement in particular, combined with the increasing importance of the littoral regions of the world as population and economic centres (and the growing importance of aquaculture),[122] along with Britain's dependence on the global trading system, all point to a maritime strategy. Major General Howes is especially clear in this regard:

> There are only two means of theatre entry when not invited, and they are by exploiting the global commons of either the sea or air space. The latter would require massive new investment by this country and would only ever partially meet the need to lift combat units let alone sustain them. There is a reason why 92 per cent of the world's trade is moved by sea. The force of twenty-four US Apache helicopters that deployed to the Bosnian conflict required 6,200 protective troops and command and support personnel, 550 C-17 flights and 26,000 tons of supporting equipment. Further, air insertion is binary not rheostatic – you cannot loiter. It forces your hand. You are either in or you are out.[123]

Such a strategy would place:

> An emphasis on mobile expeditionary forces rather than large garrisoning ones. Since, the sea remains at once the world's largest manoeuvring space, a major source of reduced vulnerability and also provides the basis for the globalised trading system on which our peace and prosperity depend, it makes sense for these to be 'maritime' in the sense that Sir Julian Corbett … used the term – that is in relation to the activities of joint forces in circumstances in which the sea is a significant factor.[124]

[122] DCDC, *Global Strategic Trends*, pp.111-112.
[123] Howes, 'Vast Ills Follow a Belief in Certainty', p.24. The deployment was in fact to Albania in support of Operation *Allied Force* against Yugoslavia.
[124] Till, 'Back to Basics', p.15.

This quotation contains two essential points; first, the sea constitutes a manoeuvring space – in other words, it can be utilised to gain access and to use the mobility it permits for operational advantage; second, a maritime strategy links the sea with joint forces – it is not a naval-centric strategy. In this respect, the purpose of a maritime strategy is to enable access to, and shape the battlespace across the environmental domains in order to secure a positive outcome for the country's national policy aims. The *Versatile Maritime Force* concept (see chapter two, pages 93-94) of the early 2000s reflected this thinking, and made a particularly valuable point: the need for maritime forces to be 'fully interoperable with the Future Army [and] Future Air Force': this issue will be returned to in more detail below. First, however, it is useful to briefly examine the roles of each of the three services in a maritime strategy. With regard to the Royal Navy, as discussed in chapter five (see page 166) Corbett defined the 'functions of the fleet' in terms corresponding to international engagement, sea control and power projection in the contemporary lexicon. By placing international engagement as the first function of the fleet, the role of the Royal Navy in providing forward presence is emphasised. This would call for a:

> … Strategy of engagement and presence in areas where we are sure we need to be. We should be part of the scenery in all areas of particular concern helping…to massage the environment 'in a nice way,' to influence events, help stop them go bad, monitor what is going on, provide continuous insight and early warning that something more serious may need to be done and to help build local capacities to do what does need to be done. Above all, this requires presence of a non-committing sort. This means recognizing that 'stabilisation' operations which mean, in effect, picking up the pieces after a conflict are, in fact, a recognition of failure.[125]

Moreover, maintaining a forward presence, and undertaking maritime security tasks (such as counter-piracy operations) provide valuable training opportunities for ships' companies, with long deployments enhancing warfighting capabilities and engendering sustainability and resilience.[126] Further, global deployments also support Foreign and Commonwealth Office requirements.[127]

A major role for the Royal Navy in those sorts of operational circumstances would be one of facilitating the deployment of ground forces by reducing the

[125] Till, 'Back to Basics', pp.12-13.
[126] Interview with Admiral Sir Nigel Essenhigh.
[127] Ibid.

efficacy of enemy ground and seaward defences (precursor operations) and also through securing control of maritime communications, in order to allow their exploitation for the purpose of projecting power (at sea or from the sea) whilst denying their use to an adversary.[128] From this, theatre access can be secured, even if 'not invited', thereby enabling the deployment of, and provision of support to the Army. In this regard, the significance of providing a credible forward presence can be highlighted. The presence of credible naval forces in a region may be sufficiently reassuring to convince neighbouring states that a regional power can be successfully confronted, and therefore grant ABO for land-based forces. The Coalition response to the Iraqi invasion of Kuwait in 1990 is a valuable example of this occurring, as Tim Benbow describes:

> The aim of the initial Coalition deployment of military forces in response to the Iraqi invasion of Kuwait was to contain the conflict, and particularly to prevent a further advance into Saudi Arabia and hence keep free the ports and air bases needed for subsequent reinforcements. Naval forces played a leading role in this initial deployment, along with light ground forces and quick-reaction air forces: an hour after the start of the Iraqi invasion, one carrier group was ordered to the Gulf of Oman and another to the eastern Mediterranean. Most importantly, carrier air power arrived in the theatre ready immediately for combat and with its own logistical support….[129]

This meant, as Benbow states:

> …Without their availability, Saudi Arabia would have been taking a huge risk in allowing in Coalition forces, given the size of the Iraqi army on its border. Maritime forces therefore played a critical part in establishing a force capable of deterring an Iraqi push into Saudi Arabia…[130]

The Coalition response to Iraq's invasion of Kuwait illustrates the role of maritime forces in securing theatre access; it also indicates the utility of carrier airpower as an integral component of an expeditionary strategy. That is, without the presence of carrier-based aviation, theatre-entry forces – including those required to facilitate the deployment of land-based aircraft – would have had to deploy into the region in the face of the Iraqi Air Force and a nervous Saudi Arabia that might not have opened up its air bases. Had the Coalition been

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[128] Ibid.
[129] Tim Benbow, 'Maritime Power in the 1990-91 Gulf War and the Conflict in Former Yugoslavia', in Andrew Dorman, Mike Lawrence Smith and Matthew R. H. Uttley (eds.), *The Changing Face of Maritime Power* (Basingstoke and London: Macmillan Press, 1999), pp.107-125, quotation, p.111.
[130] Ibid., p.111.

dependent entirely on the Royal Saudi Air Force as the means of guarding against Iraqi attempts to deny theatre access, Iraq may have felt emboldened to attempt some form of disruptive action (such as offensive counter air operations against Saudi airbases). The presence of two US carrier battle groups in theatre meant credible tactical airpower would be available to the Coalition in the event of Iraqi action. This type of threat is likely to increase as Russia and China develop and export increasingly sophisticated precision-guided surface-to-surface missile systems,[131] fourth and fifth generation combat aircraft, advanced air-to-surface and air-to-air weapons, and as potential adversaries use such capabilities to develop anti-access strategies.

The roles of the Army and RAF under a maritime strategy would not be significantly different to what they have traditionally been. They would, however, involve a departure from the recent decade-long focus on garrisoning operations in Afghanistan and Iraq – and the Cold War focus on West Germany – to an expeditionary mind-set, leveraging sea and airpower. This type of approach is already apparent in Army forward-looking thinking. The Future Land Operating Concept (FLOC), for example, states:

> …. An army without an expeditionary mindset and capability will reduce its relevance as an instrument of power. History points to an enduring requirement for the UK to project power abroad…. The UK's island status confers two main means of theatre entry; both require the exploitation of the global commons of either the sea or air space. Significant strategic mobility rests on the freedom to use the oceans, and major military operations, especially in the littoral demand sea power on a significant scale. Control of the air remains an essential prerequisite of the manoeuvrist approach… This is the joint context in which a potent land contingency force must be generated.[132]

Within this context, operations in the littoral will be particularly valuable:

> There is an increased likelihood that the joint force will be engaged in littoral operations given the predicted future operating environment. The denial or unavailability of ports, land routes, airfields or airspace may necessitate littoral manoeuvre. If so, future littoral operations in the joint operational area are likely to be founded on *joint* (or *integrated*) *action*. Amphibious forces will seek to realise simultaneous effects directly against objectives through ship to objective manoeuvre using unexpected penetration points and landing zones to avoid established defences. The seizure or denial of key terrain to the enemy may be required to facilitate the introduction of follow-on forces.[133]

[131] For example, the SS-26 'Stone' short-range ballistic missile system.
[132] MoD/DCDC, 'Future Land Operating Concept', (Joint Concept Note 2/12, May 2012), p.4-6.
[133] DCDC, 'FLOC', p.4-11.

If necessary, heavier land forces can subsequently be projected.[134] In this regard, it warrants mention that over 95 per cent of all UK military equipment deployed for Operation *Telic* – the 2003 invasion of Iraq – was transported by sea (in 60 chartered British merchant ships).[135] The priority for the Army, according to the FLOC, will be the conduct of agile, combined-arms manoeuvre, utilising highly mobile air and ground forces.[136] The importance it attaches to potential littoral operations, in particular as a means of gaining operational access, also points to the requirement for an amphibious capability; it is in this regard that the role of the Royal Marines is of significance, and will be discussed below. The FLOC also marks a significant change in thinking in the Army compared to the vision of future warfare articulated by Generals Dannatt and Richards and discussed above.

As discussed in the preceding chapters, the balance of British airpower has been subject to much debate; experience, however, particularly in the Gulf, indicates the utility of a mix of land and sea-based aviation.[137] The requirement for an agile strategy, focused on conflict prevention, points to the need for a credible carrier-based air capability. Where an airpower capability may be required on a longer-term basis, or in multiple locations (either due to the need to disperse in the face of an adversary's capabilities or in response to a number of crises), land basing will also be required. Moreover, for high-intensity conflict situations, the number of fixed-wing combat aircraft required, and the scale of operations to be undertaken, could in some cases also require the use of land bases. This is contingent on securing ABO.

The role of the Royal Air Force would be similar to that of the Royal Navy, that is, to secure access to an operational area, enabling the deployment and support of the Army.[138] UK airpower as a whole, within which the RAF is the major contributor, requires aircraft capable of providing air defence and the means to

[134] Ibid.
[135] House of Commons Defence Committee, *Lessons of Iraq Volume 1*, Third Report of Session 2003-04, HC 57-1 (London: The Stationery Office, 2004), p.81.
[136] DCDC, 'FLOC', p.4-7.
[137] Interview with Air Vice-Marshal (Ret'd) Michael Harwood CB CBE, London, 22 May 2014.
[138] Interview with Admiral Sir Nigel Essenhigh.

promote airpower at range.[139] This requires capabilities including air-to-air refuelling, stand-off attack, ISTAR,[140] electronic warfare, and air transport.[141] The lack of a maritime patrol capability is a notable gap in air resources, the decision to remove the Nimrod being perhaps the most damaging of the SDSR.[142]

With regard to the provision of sea-based airpower, although the experience of Joint Force Harrier was less than ideal (see chapter five, pages 189-190), a joint Royal Navy-Royal Air Force approach to the delivery of maritime aviation is sensible. As discussed in chapter five (see page 189), a joint force is necessary due to the Royal Navy's difficulties in maintaining a cadre of fixed-wing aviators, but the concept also offers significant opportunities. This is especially with regard to the potential for the FAA to act as a bridge between the Royal Navy and RAF, and facilitate cross-pollination, including through exchange tours, via exposure to and immersion in the respective service cultures.[143] This approach would be a valuable conduit for developing a cross-domain capability, which as will be discussed below, can facilitate a more flexible and agile military posture. The requirements of operating from an aircraft carrier call for sustained extensive and intensive training and application by the aircrew and support personnel by day and night, in all weathers, in order to develop a fully credible and effective capability.[144] This is essential to the successful development of personnel, the ship-air interface and the integration of the aircraft carrier into a wider task group.[145] This importantly also requires the mind-set of a sea-going aviator.[146]

The RAF and the FAA, and for rotary-wing operations the Army Air Corps (AAC), should seek to develop the maximum level of commonality across fixed and rotary-wing aircraft in order to achieve efficiencies in logistic support, training and minimise the number of aircraft types in British service; the latter

[139] Interview with senior retired Royal Air Force officer, 17 June 2014
[140] Intelligence, Surveillance, Target Acquisition and Reconnaissance.
[141] Interview with senior retired Royal Air Force officer.
[142] Interview with Admiral Sir Nigel Essenhigh.
[143] Interview with Air Vice-Marshal Harwood.
[144] Tim Benbow and James Bosbotinis, 'The Interoperability of Future UK Air Power, Afloat and Ashore: A Historical Analysis', *Corbett Paper* (The Corbett Centre for Maritime Policy Studies, January 2014), especially pp.3-4.
[145] Ibid.
[146] Interview with Admiral Sir Jonathon Band.

would also offer the advantage of generating economies of scale. This would require the acquisition of maritime-capable platforms, and contingent on the RAF and AAC developing a certain level of maritime proficiency, the potential to utilise sea-basing for short-duration operations such as staging into a theatre, the provision of specialist niche capabilities or Special Forces support, could be developed.[147] The development of advanced unmanned air systems, in particular maritime-capable systems, may offer the potential to generate interoperable land and sea-based squadrons, that is, land-based squadrons capable of deploying to sea (maritime units are inherently capable of detaching and operating from ashore). For example, a maritime-capable unmanned air system under RAF control could, contingent on the ship possessing the necessary 'ground' control system and interface for the unmanned aircraft, deploy to and operate from a ship alongside FAA assets either to augment the embarked air-group or to provide a specialist capability.

The rationale for a maritime strategy is, as Corbett explained: 'to determine the mutual relations of your army and navy in a plan of war'.[148] In essence, the principal focus for a maritime strategy is not equipment (albeit accounting for the requirement for maritime-capable systems as an enabler), but rather, conceptual. It is in this regard that the role of the Royal Marines and FAA is especially significant; they are examples of forces with an extant cross-domain capability. British experience in the Falklands War and in many Cold War-era operations where Royal Marine and FAA units were augmented with Army and RAF units sheds light on this:

> In general, the greatest effect was achieved where incoming Joint augmentee [sic] units reinforced pre-existing and properly worked-up organisations. Examples of this are the integration of 2 and 3 Para into 3 Commando Brigade and 1 Sqn within the Air Group and Air Department of *HMS Hermes*…. These

[147] This is not unprecedented. For example, the United States developed in the 1960s the capability to deploy the U-2 reconnaissance aircraft from carriers, the US Army successfully operated large contingents of helicopters from carriers in support of operations in Haiti and the USS *Kitty Hawk* was utilised as a Special Forces platform for operations in Afghanistan in 2001. See Jay Miller, *Lockheed Martin's Skunk Works: The Official History* (Leicester: Midland Publishing, 1995), pp.87, 93-94 and 100; E. D. McGrady and Robert E. Sullivan, 'Operation Uphold Democracy: Observations on Joint Assault Forces Operated From a CV', Center for Naval Analyses (CRM 96-3/July 1996); and John Gordon IV, et. al., 'Leveraging America's Aircraft Carrier Capabilities: Exploring New Combat and Noncombat Roles and Missions for the U.S. Carrier Fleet' (RAND Corporation, 2006), p.27.

[148] Corbett, *Some Principles*, p.15.

> organisations were best able to absorb and assist the reinforcements in integrating, providing the professional and physical basis for effective operations in an unfamiliar environment.[149]

The above quotation is taken from a DCDC paper on the lessons of the Falklands campaign for joint operations. This paper also highlights the value of embedding 'domain experts' within units operating 'outside their normal environment' and suggests: 'These embedded experts should have an in-depth understanding of both environments, able to bridge the language and experience barrier and ease the integration of the unit into an unfamiliar environment'.[150] Moreover, '"domain expertise" is vital, especially for units trying to work *across domain boundaries*'.[151] The Royal Marines and FAA have 'domain expertise' in the maritime, land and air domains respectively and thus can provide the required domain expertise to enable joint maritime-based operations, or as the *Versatile Maritime Force* concept suggested, full interoperability with the Army and RAF. The deployment of AAC Apache attack helicopters on-board HMS *Ocean* during Operation *Unified Protector*, the 2011 campaign against Libya, provides a practical example of cross-domain interoperability:

> This deployment highlights the need for our force elements to train and equip to operate within each other's command and control structures and physical operating environments… This example reinforces the need to design cross-domain interoperability into our platforms, sensors and weapons to provide the greatest agility across Defence.[152]

It warrants mention that both the land-focused FLOC and *UK Air and Space Doctrine* refer to the importance of the sea in future operations. The FLOC, in addition to the above-quoted statement on the value of littoral manoeuvre, refers to the importance of an air manoeuvre capability,[153] which has: 'the ability to transition between roles and operate across the range of operational environments, most notably from the sea (via the littoral) to the land and back again'.[154] Significantly, *UK Air and Space Doctrine*, which has superseded the RAF's *AP*

[149] DCDC, 'Joint Operations – Lessons from the Falklands Campaign', 20 January 2009, p.6.
[150] Ibid.
[151] Ibid. Emphasis added.
[152] MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, July 2013), p.4-9.
[153] 'Air manoeuvre is conducted… in order to achieve advantage through shaping, and sustaining tasks. It can also provide the decisive act. Air Manoeuvre unites attack helicopters, ground, air assault and airborne forces, support helicopters and fires within a combined arms and joint framework'. DCDC, 'FLOC', p.4-9.
[154] Ibid., p.4-10.

3000 doctrinal document, describes the role and importance of air-sea integration as:

> The orchestration and application of air and sea capabilities to create desired joint warfighting effects within a defined area of operations in accordance with the commander's intent. Air-sea integration is necessary for many potential contingent operations, particularly where we face complex anti-access and area denial threats that we must counter with effects that we cannot create in a single operating environment.[155]

This quotation, in particular its reference to the need to create 'effects that we cannot create in a single operating environment', points again to the utility of a maritime strategy. Maritime power can be utilised effectively as a form of leverage to create a disproportionate effect on an adversary. For example, Corbett highlighted, in the context of the Seven Years' War (1756-1763), that the 'army of a sea-power … if employed amphibiously in combination with the fleet … could produce results out of all proportion to its weight as a mere military force'.[156] A notable contemporary example is that of the impact of sea-based US Marines Corps forces in the Gulf War (1991), where:

> It is understood that during Operation DESERT STORM a substantial number of Iraqi divisions were held in Kuwait, unavailable to assist in countering the allied advance along the coast from Saudi Arabia, specifically to defend against a much smaller US Marine Corps landing force poised at sea and threatening to assault Kuwait City.[157]

This effectively illustrates the 'fear of what the fleet makes it possible for your army to do', and of maritime leverage (and demonstrating poise as a credible contingency force-in-being). It also points to the cost effectiveness of maritime forces, in particular with regard to their ability to limit liability in conflict (especially limited conflicts) and achieve effect at the decisive point. Corbett succinctly described the connection between limited conflict and maritime power (and again highlighting the influence of Clausewitz in Corbett's thinking) thus:

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[155] DCDC, *UK Air and Space Doctrine*, pp.4-6 to 4-7.
[156] Corbett, *England in the Seven Years' War*, p.154.
[157] Vice Admiral Sir Geoffrey Biggs, 'The Utility of Amphibious Forces in Conventional Deterrence', *RUSI Journal*, Vol.138, No.2 (April 1993), pp.40-45, quotation, p.43. Lieutenant Colonel H. T. Hayden, USMC, states a total of 40,000 Iraqi troops were fixed on countering the sea-based threat; in contrast, the embarked US Marine force numbered 12,737. Lieutenant Colonel H. T. Hayden USMC (Rtd.), 'Amphibious Operations in the Gulf War: Operation Desert Shield, 1990-1991', in Lt Cdr Tristan Lovering Royal Navy (ed.), *Amphibious Assault: Manoeuvre from the Sea* (Royal Navy, 2006), pp.445-450, specifically, p.445.

> It would be difficult to state more pithily the ultimate significance of Clausewitz's doctrine. Its cardinal truth is clearly indicated – that limited wars do not turn upon the armed strength of the belligerents, but upon the amount of that strength which they are able or willing to bring to bear at the decisive point.[158]

Moreover, Corbett explained its historical significance for Britain, in that it provided:

> …. An explanation of one of the most inscrutable problems in history – the expansion of England – at least so far as it has been due to successful war. That a small country with a weak army should have been able to gather to herself the most desirable regions of the earth…and…at the expense of the greatest military Powers….[159]

In this respect, a Maritime Strategy would not, in essence, mark a radical departure for Britain, but rather as Till states, 'marks a return to Britain's traditional strategy, wherever possible, of offshore balancing and limited engagement for maximum effect'.[160] Codner, in an analysis of British military strategic options, suggests that two hard choices confront policy-makers regarding the future of Britain's expeditionary capability:

> The first is on the scale of capability for expeditionary operations of choice, which is a matter of acceptable affordability. The second is that between continental or maritime prevalence in such capability. Continental prevalence allows for a continuation of capabilities post-Afghanistan; that is, once fresh commitments are made to sustained ground operations, a greater ability to influence through scale and permanence is possible… Maritime prevalence, on the other hand, allows for a rational expansion of the requirements of operations of obligation … and a greater ability to influence through inducement operations early in the emergence of crises. A smaller army would offer fewer opportunities for participation in enduring coalition ground operations, and a de facto lower risk of embroilment… Only the maritime option will preserve vestiges of full national autonomy to serve purely national military obligations and interests abroad.[161]

This points to the circumstances in which a Maritime Strategy may be adopted. The experience of Iraq and Afghanistan is likely to act as a deterrent to further enduring ground operations (the 2013 Parliamentary vote against intervention in Syria is suggestive of a deeper concern regarding intervention operations), whilst the SDSR, as discussed above, places emphasis on conflict prevention within a national policy context which continues to emphasise a commitment to

[158] Corbett, *Some Principles*, p.58.
[159] Ibid.
[160] Till, 'Back to Basics', p.18.
[161] Codner, 'A Force for Honour?', pp.171-172.

maintaining the means to project power and influence globally. That is, a set of circumstances pointing to a preference for maritime prevalence. Moreover, the adoption of such a strategy (or an alternative strategic concept)[162] would facilitate a closer harmonisation of national policy, military strategy and defence industrial policy, thus addressing the issues of short-termism and the lack of a 'grand strategic manifesto', as discussed earlier in this chapter.

Conclusion

This chapter has sought to combine an analysis of the debate concerning the *Queen Elizabeth*-class aircraft carriers within the context of wider British defence policy and its implications for the perception of the broader utility of maritime power, with an assessment of the rationale for and utility of a potential British Maritime Strategy. The analysis of the carrier debate particularly focused on the influence of countervailing factors on the programme and the perceived relevance to British strategy both of aircraft carriers and of maritime forces more generally. This highlighted the growing resource and budgetary constraints affecting the MoD as a consequence of an inherently unstable equipment programme, the campaigns in Iraq and Afghanistan and latterly, the economic environment following the 2008 financial crisis. It also highlighted the Army-led debate on the changing character of warfare in light of the enduring counter-insurgency operations in Iraq and Afghanistan, and whether this required a more fundamental shift in defence planning, including whether investment in high-end maritime platforms was necessary.

This formed for the basis for evaluating the SDSR, in particular with regard to the debate within that review concerning whether to proceed with the procurement of the *Queen Elizabeth*-class aircraft carriers. This debate was intense and went beyond a consideration of the military utility of the carriers, and focused especially on the industrial implications of cancelling or proceeding with one or both ships. This analysis also raised the issues of short-termism and whether Britain has a clearly conceived, long-term approach to national policy and strategy. Again, the carrier debate has highlighted both occasions where policy has

[162] For an overview of potential British strategic options and their implications, see Codner, 'A Force for Honour?', pp.163-165.

been determined by short-term pressures resulting in mid-to-long-term negative implications, in particular with regard to cost; conversely, the carrier programme also highlights aspects of a long-term approach, especially in terms of articulating a sustainable maritime industrial base and the acquisition of a joint fifth generation airpower capability.

Proceeding from the analysis of the carrier debate, the question of a British Maritime Strategy was examined, considering in turn, Britain's strategic context, the evolving nature of the international system, the utility and implications of a maritime strategy and the circumstances under which such a strategy may be adopted. The analysis has indicated that based on Britain's dependence on the international trading system, its significant globally-distributed economic and territorial interests, an evolving international system that is increasingly multi-polar and unstable, and emergent military trends, a Maritime Strategy would provide the 'agile and far-sighted' strategy required to protect and project Britain's interests in an uncertain strategic environment. Such a strategy would be consistent with British national policy as it is currently articulated and aids in placing the carrier question into context. British national policy calls for the capability to shape the international environment and project power globally, albeit on a limited scale; aircraft carriers enable Britain to do this without the constraint and cost associated with being dependent on land bases. It must be emphasised that aircraft carriers are not a military panacea for Britain, nor should the preceding discussion on the potential utility of a Maritime Strategy be seen as arguing for a naval-centric approach to Britain's defence requirements. Rather, it is suggested that a maritime-enabled expeditionary approach to Britain's defence and national policy needs may constitute an affordable, effective and credible solution for British national policy. The nexus of the role of aircraft carriers to British strategy, whether and to what extent such a strategy should be maritime, and the connection with national policy constitutes the core of the analysis in this thesis and will be the focus for final reflection.

Conclusion

The core purpose of this thesis has been to examine the connection between British national policy and maritime strategy. It has, to this end, focused on the debate concerning the rationale for and design and development of the *Queen Elizabeth*-class aircraft carriers. This programme constitutes a valuable case study as it ultimately concerns an assessment of the strategic utility of maritime forces and their role and importance to wider British military strategy and national policy.

Underpinning the analysis throughout the thesis is the question: what is the strategic utility of maritime forces? This question provides the connecting skein of thought linking the analysis of the nexus of seapower, maritime strategy and national policy, the development of British maritime thinking and contemporary doctrine, with the debate on the *Queen Elizabeth*-class aircraft carriers and whether Britain requires a maritime strategy. Further, the debate on the *Queen Elizabeth*-class, especially with regard to the value of aircraft carriers to British strategy and the balance of UK airpower, plus the wider debate on a maritime versus continental strategy, sheds much light on British perspectives on the utility of maritime forces. In this respect, the competing claims of the various parties to the debates, for example, between those who advocate a continental approach to Britain's defence needs rather than a maritime strategy, provide valuable counter-arguments and perspectives against which thinking on the value of maritime forces can be tested.

From the analysis, three principal issues assume a particular prominence; the role of aircraft carriers in British strategy; the strategic utility of maritime forces and whether there is a requirement for a Maritime Strategy; and the connection between British national policy and maritime strategy. Each of these issues will be reviewed below, drawing especially upon the lessons of the CVF programme and their implications for British military strategy and national policy. This approach also facilitates the analysis by moving progressively up through the levels of strategy, that is, from the operational through the military-strategic to the grand strategic. Within this analysis, three questions are also considered: to what extent

are aircraft carriers an essential component of British strategy and what would be the implications of foregoing the capability they provide? Why would a Maritime Strategy be of utility to the UK, and what would be the implications for British national policy? Finally, how does national policy influence the development of strategy and the requirement for particular military capabilities: for example, why does British national policy as currently defined, call for high-end warfighting capabilities as represented by such assets as aircraft carriers and fifth generation combat aircraft?

The Role of Aircraft Carriers in British Strategy

The role of aircraft carriers in British strategy, and their utility to it, has been subject to much debate (see particularly chapters three and four), especially with regard to whether such ships are a vital capability for Britain; the level of carrier capability to be sought (if any); and how, more broadly, maritime aviation fits into Britain's overall airpower requirements. Further, this is an enduring debate with both a long-term influence on, and implications for, British thinking on aircraft carriers. In this respect, the Royal Navy's thinking on the nascent CVF programme in the late 1990s was shaped, to arguably quite a significant extent, by the experience of the 1960s debate on, and ultimate cancellation of the previous *Queen Elizabeth*-class (CVA-01) aircraft carrier programme. This is particularly evident in naval efforts to convince the Royal Air Force (RAF) that CVF would be 'their carrier as well' and that the ships would be 'joint defence assets',[1] in order to secure acceptance of the replacement carrier programme and avoid the inter-service tensions associated with CVA-01.

The legacy of the CVA-01 debate was also a major factor in the decision to combine the Fleet Air Arm's Sea Harrier and RAF Harrier forces to form Joint Force Harrier.[2] The concept of an interoperable land and sea-based joint force, although commendable in theory, has proved flawed in execution, most notably

[1] Interview with Vice Admiral Sir Jeremy Blackham, London, 13 February 2012; and Commander D. R. James, Royal Navy, 'Carrier 2000: A Consideration of Naval Aviation in the Millennium – II', *The Naval Review*, Vol.87, No.2, (April 2009), pp.105-113, quotation, p.113.
[2] Nick Childs, *The Age of* Invincible: *The Ship That Defined the Modern Royal Navy* (Barnsley: Pen and Sword Maritime, 2009), pp.145-146. For a study of the Royal Navy's attempt in the early 1960s to develop a joint force, see Eric Grove, 'Partnership Spurned: the Royal Navy's Search for a Joint Maritime-Air Strategy East of Suez, 1961-63' in N.A.M. Rodger (ed.), *Naval Power in the Twentieth Century* (Basingstoke: Macmillan, 1996).

due to tensions between the Royal Navy and RAF, the RAF's reluctance toward embarked operations and the focus on land-based deployments in Iraq and Afghanistan. Moreover, despite the creation of Joint Force Harrier in 2000, and with it the commitment on the part of the RAF to an interoperable land and carrier-based force, the RAF had sought to shape the Joint Combat Aircraft (the joint Harrier replacement) and CVF programme in such a way that would restrict the level of airpower capability that Britain could generate from the sea. The RAF's attempt to scrap the Harrier force in 2008, and the context within which the SDSR was undertaken also highlighted the challenges confronting the future of British maritime airpower at the end of the first decade of the 21st century. However, as discussed in chapter five, the prospects for cooperation between the Royal Navy and RAF appear to be increasingly positive and with it, for Joint Force Lightning.

The UK's National Security Strategy states that Britain requires the 'capability to act well beyond our shores and work with our allies to have a strategic presence wherever we need it'.[3] In order to fulfil this aim without being dependent on foreign-controlled access, basing and overflight (ABO) arrangements, Britain requires credible carrier airpower. Such a capability, founded upon the attributes of maritime forces (particularly access, mobility, versatility, sustainability and leverage), combined with those of airpower (namely, speed, reach, height, ubiquity, agility and concentration) provides the means to project power and influence effectively at the strategic level. This is based upon the aircraft carrier's ability to provide sovereign, forward deployed and self-sufficient combat-ready airpower. Moreover, maritime-based assets are *relatively* less vulnerable to attack than land-based forces (taking into account their exposure to maritime-specific threats such as torpedoes and naval mines but also their low or non-existent exposure to many conventional and irregular threats that affect land-based forces), and importantly, through not being deployed on land, limit liability in a crisis or confrontation. In short, the utility of an aircraft carrier is its ability to provide choice and a flexible, scalable response to a very wide range of dynamic situations. If combined with a forward presence, this may deter conflict from

[3] Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The National Security Strategy*, Cm 7953 (London: The Stationery Office, 2010), p.4.

breaking out or, if it should break out, permit an early response that could prevent escalation and make a later, heavier commitment unnecessary. In this respect, aircraft carriers can provide a central component of a conventional deterrence strategy.[4]

The range of options open to policy-makers, and the ultimate strategic utility and credibility of an aircraft carrier, will be to a significant extent dependent on the size, composition and credibility of its embarked air group. As discussed in chapter three, and evident in the development of the CVF programme, larger carriers provide greater flexibility, versatility and military capability than smaller vessels. Most significantly, larger carriers enable the embarking of larger air groups, potentially also allowing the deployment of specialist capabilities, that can deliver a greater level of combat power and enhancing the ability of the ship to provide influence. For the UK, the decision to develop the *Queen Elizabeth*-class as large carriers, capable of embarking 36 fast jets, plus an airborne surveillance and control system (initially to be helicopter-based) and helicopters, was motivated by the experience of operations in the Balkans and Persian Gulf during the 1990s where the need for a greater capability than that provided by the *Invincible*-class was highlighted.[5] In addition, and emphasising the influence role (in this case, vis-à-vis allies) of carriers, a larger air group was sought in order to enable the UK to have the largest possible role within coalition planning via a significant contribution to the Air Tasking Order for day one operations.[6]

The credibility of the air group and wider ship-air interface is contingent on the aircrew and support personnel being proficient in operating on-board and from the carrier. This requires sustained embarkation in order to generate the experience and level of proficiency necessary to underpin maritime air operations by day and night in all weather conditions. This aspect of maritime aviation has itself been subject to significant debate in the UK and a source of tension between the Royal

[4] The UK has extensive experience in the use of carriers (and amphibious ships), including in deterrent situations. For a detailed and valuable survey of British experience since the Second World War, see Tim Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships: 1945-2010', *Corbett Paper* No. 9 (The Corbett Centre for Maritime Policy Studies, March 2012).
[5] For example, see Rear Admiral Sir Iain Henderson CBE, 'My Jobs: Joint Force Harrier Commander', *RUSI Journal*, Vol.145 No.3 (June 2001), pp.21-27.
[6] Lee Willett, '"More Than Just Spare Airfields": Defence Policy, Defence Reviews and the Queen Elizabeth-class Aircraft Carriers', in Tim Benbow (ed.), *British Naval Aviation: The First 100 Years* (Farnham: Ashgate, 2011), pp.197-226.

Navy and Royal Air Force. The RAF has argued that airpower is indivisible and that all British airpower resources should be under its ownership. This argument was especially prominent in the inter-war period, the 1950s and 1960s and more recently, appears to have formed a key element of a serious inter-service dispute in 2008-09 (see chapter five, pages 187-188). In this respect, the RAF has argued that maritime aviation is not fundamentally different to land-based airpower and can be effectively delivered under its control. However, historical experience has shown this argument to be flawed and resulting in a sub-optimal capability.[7]

The role and contribution of maritime aviation to wider British airpower has also been an area of much debate. Again, this has been an area of contrasting perspectives between the Royal Navy and RAF. The debate concerning the variant of F-35 to be selected for the Joint Combat Aircraft (JCA) requirement is a notable example in this regard. Although the Ministry of Defence's own analysis indicating that the catapult-assisted take-off but arrested recovery (CATOBAR) variant of the F-35 – the F-35C – constituted the more capable aircraft as well as being cheaper over the longer term, the short take-off and vertical landing (STOVL) variant, the F-35B, was selected. As discussed in chapter four, this was not the decision recommended by the MoD. However, industrial support from BAE Systems and Rolls-Royce, and RAF lobbying for a STOVL-based carrier capability, in part motivated by the desire to protect its own Future Offensive Air System (FOAS) programme, were major factors in the variant decision. FOAS was an ambitious project to develop a replacement for the Tornado and was possibly intended to provide a level of capability a step-up from that provided by the JCA. In other words, the RAF sought to ensure that the UK's principal combat air capability would be provided by a land-based air system as opposed to, had the F-35C been selected, an aircraft capable of operating from both land and sea. More importantly, the acquisition of the F-35C would have marked a significant qualitative increase in the Fleet Air Arm's contribution to British airpower (half of the originally planned F-35 buy was to be for the Fleet Air Arm, that is, 75

[7] Geoffrey Till, *Air Power and the Royal Navy 1914-1945* (London: Jane's, 1979); and Christina J. M. Goulter, *A Forgotten Offensive: Royal Air Force Coastal Command's Anti-Shipping Campaign, 1940-1945* (London: Frank Cass, 1995) (especially chapters one to three) provide much valuable insight, particularly with regard to the inter-war period and the impact of RAF control of sea-based aviation.

aircraft)[8] and arguably, made the sea-based element of British combat airpower just as significant as that of the land-based element provided by the RAF. It warrants highlighting that this would be contingent on the ability of the Fleet Air Arm to maintain a sufficient cadre of fixed-wing pilots and associated skill set for CATOBAR operations, which could pose a significant challenge.

The issue of the balance of British airpower leads to the fundamental question of the extent to which aircraft carriers are a required component of Britain's defence posture. As discussed in chapter six, Britain is a maritime trading nation dependent on the global trading system for its prosperity and economic security, in particular with regard to strategic raw materials, which are principally sourced from the Middle East and southern Africa. Moreover, Britain has territorial interests and treaty obligations in the Caribbean, South Atlantic, Mediterranean and Far East. In other words, the UK has to, as the National Security Strategy and Strategic Defence and Security Review state respectively, be capable of having a strategic presence wherever necessary in order 'to shape a stable world, by acting to reduce the likelihood of risks affecting the UK or our interests overseas, and applying our instruments of power and influence to shape the global environment and tackle potential risks at source';[9] that is, to contribute to ensuring a stable international system and thus the conditions for trade. Unless the UK is prepared to accept the political, military and logistical constraints associated with securing ABO rights for land-based forces, aircraft carriers are, as Tim Benbow suggests, 'essential for a viable British strategy'.[10] This is because, the UK, as Professor Colin Gray argues, has to broadly follow an expeditionary approach to warfare.[11] This necessitates sea-based aviation in order to provide affordable, independent and strategically credible deployable airpower,[12] and ensure that British expeditionary forces have sufficient control of the air, to enable:

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[8] Interview with Captain Jock Alexander OBE Royal Navy, (then) Naval Staff – Assistant Head Carrier Strike and Aviation, London, 3 May 2012.
[9] See Her Majesty's Government, *Securing Britain in an Age of Uncertainty: The National Security Strategy* (NSS), Cm 7953 (London: The Stationery Office, 2010), p.4; and *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review* (SDSR), Cm 7948 (London: The Stationery Office, October 2010), p.9.
[10] Benbow, 'British Uses of Aircraft Carriers and Amphibious Ships', 'Key Points'.
[11] Colin Gray, 'Britain's National Security: Compulsion and Discretion', *RUSI Journal*, Vol.153, No.6 (December 2008), pp.12-18.
[12] Interview with Rear Admiral Tom Cunningham CBE, Rear Admiral Fleet Air Arm, Portsmouth, 1 July 2011.

> … Military freedom of manoeuvre in the air, land or sea environments. This allows our commanders to seize the initiative while denying it to the enemy. Control of the air is a relative condition and depends on available resources and the risk that a commander is prepared to accept.[13]

As the quotation also makes clear, control of the air is relative and in most likely contingencies, British forces would be operating in concert with allies such as the US, France and other NATO members, deploying either land or sea-based fast jets (or a combination of the two) capable of contributing to the attainment of air superiority; in addition, anti-air warfare-focused Type 45 *Daring*-class destroyers would be providing escort for a British aircraft carrier thereby providing a substantial air defence capability. The principal role for the *Queen Elizabeth*-class, from inception, is intended to be power projection (as discussed in chapter three, see pages 124-126). Although the Carrier Enabled Power Projection approach is primarily intended to offer a combined carrier strike and littoral manoeuvre capability, the ability to employ the *Queen Elizabeth*-class in a traditional fixed-wing focused role is to be retained, and if required, a 36-strong F-35B air group could be embarked.[14] Whilst noting the caveat mentioned in chapter three (see page 116) regarding the need for the additional pilots and support personnel to be proficient in carrier operations, thus necessitating regular and sustained embarkation, the ability to deploy a force of 36 carrier-based fifth generation strike fighters will provide a most valuable military capability and contribution to British strategy. Moreover, and of greatest significance is the long-term growth potential and versatility that the *Queen Elizabeth*-class offer policy-makers, a point effectively conveyed by Rear Admiral Chris Parry:

> …. Large hulls (and in particular, aviation-capable 'flat-tops') are inherently flexible and adaptable in their potential for use, because of their size, shape and stowage arrangements, together with the lift and shift virtues of their aviation assets. This means that carriers can operate throughout the spectrum of crisis from combat operations to humanitarian relief….[15]

This flexibility was also important in ensuring the ships 'survived' the SDSR process, by enabling an emphasis to be placed on their role in support of

[13] MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, July 2013), p.3-3.
[14] HM Government, *SDSR*, p.23.
[15] Rear Admiral Chris Parry, 'The United Kingdom's Future Aircraft Carriers: What Are They Good For?', *RUSI Journal*, Vol.157, No.6 (December 2012) pp.4-9, quotation, p.9.

amphibious and rotary-wing operations (more akin to an LHD), which were seen as more relevant than the originally-intended medium scale offensive fixed-wing strike capability.

Does the United Kingdom Require a Maritime Strategy?

The roles and utility of maritime forces, and maritime strategy, have been a significant factor in British strategic debate for more than a century. As discussed in chapter two, there is a discernible British school of maritime thought, dating back to the late 19th century and still highly relevant to contemporary British maritime thinking and doctrine. The core tenets of this school are; a maritime as opposed to naval approach to the exploitation of the sea; a focus on linking maritime power to grand strategy and national policy; and a pragmatic approach to the securing and exploitation of the control of maritime communications, in order to enable the projection of power from the sea. A significant factor in the development of British maritime thought, and one that is of enduring importance, is that of the influence of strategic context, history and identity. As an insular maritime nation, the control of maritime communications was and continues to be of paramount importance to Britain. This also explained the difference in emphasis between, for example, Rear Admiral Alfred Thayer Mahan, US Navy, and British contemporaries such as Vice Admiral Philip Colomb. Mahan, focused on explaining the general role and importance of seapower because his audience – the policy-makers of a large continental power - had to be educated in why seapower mattered at all, before debating how it could be exploited. In contrast, British thinkers such as Colomb, Sir Julian Corbett, and Admiral Sir Herbert Richmond all lectured to an audience already familiar with the concept of seapower, that is, the officers of the Navy of a maritime state. For Britain, as an island state, the role and influence of the sea was central to developing an appropriate strategy; moreover, such a strategy would, as discussed in chapters two and six be inherently joint.

The utility of maritime forces derives from their ability to exploit the sea as a means of communication, and thus gain access to an area, even if uninvited. Conversely, maritime forces can similarly deny an adversary the use of maritime communications in order to restrict his strategic and operational options. This also

enables in certain circumstances (for example, if the conflict area can be isolated from one of the belligerents), a conflict to be kept limited.[16] In addition, maritime forces enable the state deploying them to tailor very precisely, or if necessary limit liability in a conflict, thus potentially providing a more cost-effective approach to operations than deploying larger-scale land-based forces.[17] The ability of maritime forces to operate forward, providing presence in a region of interest, without being dependent on ABO, and logistically self-sufficient and combat-ready, makes them especially valuable as a 'force for influence'. The US Navy for example, sees its carrier strike groups as national assets for influence.[18] In this respect, maritime forces can contribute significantly to the prevention or containment of conflict; notable examples of this are the British response to an Iraqi threat to Kuwait in 1961, the Coalition response to the Iraqi invasion of Kuwait in 1990 and the US response to Chinese attempts to coerce Taiwan in 1996.

Significantly, as shown in the Coalition response to Iraq's invasion of Kuwait, the forward presence and responsiveness of maritime forces can also provide the necessary reassurance for regional states to grant ABO for land-based forces. This reflects a central tenet of the British maritime school: the need to coordinate at the strategic level, the actions of the Royal Navy, the Army and the Royal Air Force (albeit, a later addition), a point well-articulated by Vice Admiral Sir Peter Gretton.[19] Professor Geoffrey Till, moreover describes the historical connection between the Royal Navy and the Army, in particular with regard to the role of the Army in preserving and extending British maritime strength:

> Strategically, the two services were seen as complementary; both could serve the interests of the other. Historically and strategically the Army could be used to protect the Low Countries, preventing their vital ports from falling into the hands of hostile navies – an imperative ranging from Elizabeth's war against Spain in the sixteenth century to the Passchendaele campaign in the twentieth. Indeed interventions on the mainland were occasionally justified on the grounds that this

[16] Ibid., p.59.
[17] Geoffrey Till, *Seapower: A Guide for the Twenty-First Century*, Second Edition (Abingdon: Routledge, 2009), p.60.
[18] Interview with US Navy officer, London, 28 September 2011.
[19] Vice Admiral Sir Peter Gretton, *Maritime Strategy: A Study of British Defence Problems* (London: Cassell, 1965), p.3.

> would protect Britain's position at sea by preventing the emergence of a hostile power or coalition strong enough to generate a dangerous *maritime* threat.[20]

In terms of the current and prospective strategic environment, as discussed in chapter six, the need for the three services to harness their complementary capabilities to the maximum possible extent in order to operate successfully in an increasingly unstable and contested operational environment, will be of significant importance. As Professor Colin Gray ably summarises, this points to the requirement for a maritime approach to British military strategy:

> British defence strategy needs to be maritime, because this orientation covers our ability to respond effectively to most of the menaces to our survival and vital interests. 'By maritime strategy we mean the principles which govern a war in which the sea is a substantial factor', to quote the still pertinent formula crafted by Sir Julian Corbett a century ago. This translates as a strategy that has maritime control at its core, but which enables power and influence to be projected inland, albeit hopefully briefly and in modest quantity. For geopolitically and geostrategically insular Britain, next to acting maritime in godliness is the necessity to think, strategise, buy, train and act truly in a joint as well as in a 'combined' manner. It is foolish to debate whether the RN and RAF exist primarily to support the Army, or vice versa. In common with war, warfare, peace and crisis, military power is a unity.[21]

This quotation contains three significant points. First, it explicitly links Britain's geopolitical and geostrategic position as an insular nation to the need for a maritime approach to national military strategy. Secondly, such a strategy requires both the means to secure maritime communications and project power from the sea into the land environment. This points to the requirement for a navy that can undertake both 'at sea' and 'from the sea' warfighting roles.[22] This requires the investment in high-end naval capabilities that was questioned, in particular by the Army, as the Labour government under Gordon Brown sought to overcome growing budgetary pressures and the impact of the enduring campaigns in Iraq and Afghanistan (discussed at length in chapter six). Third, the requirement to project power and influence inland, and the emphasis on developing joint capabilities (conceptually, operationally and in procurement) points to, as discussed in chapter six, the value of cross-domain capable forces, in particular, the Fleet Air Arm and Royal Marines, which can provide the domain expertise

[20] Geoffrey Till, 'Corbett and the Emergence of a British School?' in Geoffrey Till (ed.) *The Development of British Naval Thinking* (Abingdon: Routledge, 2006), pp.60-88 (quotation, p.84). Emphasis original.
[21] Gray, 'Britain's National Security', p.16.
[22] See chapter two, pages 90-92 for a discussion of these roles.

necessary to enable Army and Air Force operations from the maritime environment.

The above quotation from Gray refers to the requirement for British defence strategy to be maritime in order for it to be capable of responding effectively to 'most of the menaces to our survival and vital interests'. This raises the issue of British national policy aims and what constitutes Britain's vital interests. Such a discussion is necessarily subjective and open to diverse interpretation. The discussion in chapter six, however, focused on Britain's dependence on the international trading system and access to foreign sources of strategic raw materials as key drivers for a national policy that would seek to protect trade and the conditions for trade. The former could be accomplished via an approach focusing on the constabulary use of maritime forces to protect the ships themselves that convey goods to the UK. In addition, such a task could be fulfilled by maritime forces contributing to a wider alternate strategy, for example, as the Army advocated, one focused on stabilisation or as was the case in the latter part of the Cold War, a continental strategy. The latter in contrast, requires the capacity to both undertake the 'at sea' protection of shipping role and more importantly, project power *from the sea* in order to 'shape a stable world … and tackle potential risks at source'. It is this proactive, shaping role that requires a robust maritime core to British strategy in order to underpin the agility and flexibility needed to respond to an inherently dynamic and uncertain strategic environment. A strategy that was based predominantly on land-based forces would not, for the reasons discussed (namely, securing ABO, the logistics involved in deploying land-based forces and providing force protection, and most significantly, the costs involved) in the preceding chapters and in this analysis, fulfil the objectives set by national policy. The influence of national policy on, and its implications for British strategy will now be assessed.

The National Policy-Maritime Strategy Nexus

The analysis in this thesis, in particular with regard to the development of the *Queen Elizabeth*-class aircraft carriers and the investigation of potential alternatives (see chapter five), has been based on the national policy baseline set out in the 2010 NSS. This national policy statement calls for Britain to maintain

an internationally active posture, working in concert with allies and maintaining a capacity to project power globally where and when necessary.[23] Moreover, as examined in chapter six, Britain is heavily engaged with, and dependent (relative to comparable economies) on the globalised trading system and based on trade or access to resources, has a particular interest in the Far East, Persian Gulf and Africa. This, as Professor Geoffrey Till suggests, points to a policy focused on the defence of, and conditions for trade.[24] The combination of Britain's strategic context, the evolving character of the international system and the versatility and agility of a maritime-based expeditionary posture[25] point to the utility of a Maritime Strategy. Such a strategy would contribute to the stated national policy aim of being capable of acting 'well beyond our shores', maintaining a 'full and active engagement in world affairs' and fulfil the requirement to project power. The latter is significantly couched in terms of Britain's position as an ally of the US, a member of the EU and NATO and a permanent member of the United Nations Security Council. This suggests that Britain continues to see itself as a major power, thus requiring a commensurate level of military capability.

The implication for a notional maritime strategy is that a certain level of warfighting capability is required both for operations at and from the sea, thus necessitating investment in, for example, aircraft carriers, amphibious ships, strategic airlift and expeditionary ground forces, in order to provide the means to project power, including the insertion of land-based forces. It is in this regard that the connection between national policy and maritime strategy – or a continental or other potential alternative strategic approach – is significant. As discussed in chapter one, national policy provides the ends for which strategy – the ways – must aim to fulfil. The analysis in chapter five, specifically noted that, with regard to potential alternatives to aircraft carriers, without radical change in British defence and foreign policy objectives and with it a shift away from a power projection capability, aircraft carriers provide a cost-effective and flexible means of providing such a capability.

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[23] HM Government, *NSS*, p.4

[24] Geoffrey Till, 'Back to Basics: British Strategy After Afghanistan', *Corbett Paper* No. 6 (Corbett Centre for Maritime Policy Studies, July 2011), p.6.

[25] For example, see Buster Howes, 'Vast Ills Follow a Belief in Certainty', *RUSI Journal*, Vol.156, No. 3 (June/July 2011), pp.20-25.

This is relevant at the strategic level. Whilst British national policy remains committed to what is effectively an expeditionary posture and a limited global power projection capability (including a potentially enhanced east of Suez role)[26], the case for a maritime strategy, as articulated by, for example, Till, Gray and Howes (see chapter six, pages 223-234), is compelling. Moreover, it warrants mention that both the Army's Future Land Operating Concept (FLOC)[27] and the joint (though Royal Air Force-led) *UK Air and Space Power Doctrine*[28] documents, as cited in chapter six, discuss the importance of the maritime environment to land and airpower respectively. However, although the FLOC may speak favourably of joint force capabilities and refer to 'sea power on a significant scale', would, for example, Army support be forthcoming for an expansion of financial resources – at the possible expense of the Army – to fund an increase in the size of the Royal Navy, in particular as economic constraints are unlikely to allow a substantive increase in the overall defence budget? Similarly, in the context of developing joint capabilities, can *enduring* agreement between the Royal Navy and Royal Air Force be achieved on the balance of UK airpower? The creation of Joint Force Harrier was intended to underpin a closer Royal Navy-Royal Air Force relationship, but ultimately failed. Most importantly, could consensus be achieved between the three services on the extent to which, as Gray argues, strategic thinking, training, procurement and action need to be approached in a joint, maritime manner, and 'whether the RN and RAF exist primarily to support the Army, or vice versa'?

Questions such as those above illustrate the inescapable influence of politics – broadly defined (that is, whether from government, industry, inter-service, intra-service) – on the development of strategy. It is likely that, as notable examples of 'strategic maritime assets', the debate on the maritime contribution to British strategy and national policy will focus to a significant extent on the value of the *Queen Elizabeth*-class aircraft carriers when one or both ships enter service. Whereas in the late 1990s and early 2000s, Royal Navy thinking on the *Maritime*

[26] For discussion of this, see Gareth Stansfield and Saul Kelly, ' Return to East of Suez? UK Military Deployment to the Gulf', *Briefing Paper* (RUSI, April 2013).
[27] MoD/DCDC, 'Future Land Operating Concept', (Joint Concept Note 2/12, May 2012), especially p. 4-6.
[28] MoD/DCDC, *UK Air and Space Doctrine* (Joint Doctrine Publication 0-30, July 2013), especially p. 4-6 to 4-9 on 'Air-Sea Integration'.

Contribution to Joint Operations, the *Future Navy* and *Future Navy Operational Concept*, and the associated *Versatile Maritime Force* concept, were utilised to provide an intellectual framework for the development of CVF (see chapter two, pages 93-94), it may be the case that the *Queen Elizabeth*-class will achieve as great an effect, not in an expeditionary operation against a putative adversary, but in influencing debate in Whitehall via a tangible demonstration of the strategic utility and *relevance* of maritime forces.

In this respect, the *Queen Elizabeth*-class will be adding to an already substantial body of knowledge and experience of the contribution of maritime forces (including a century of maritime airpower) to British national policy. Corbett drew upon the lessons of history, linking Britain's national context and identity in order to elucidate why Britain required a maritime strategy. This enabled Corbett to articulate a vision of British strategy – with maritime power at its core – that has an enduring relevance, as explained by Professor Andrew Lambert:

> Corbett found in the past a British strategy that was unique, specific and appropriate, It blended naval and military action, political direction, and economic interests into an almost seamless whole…. One way or another his ideas survived the ill-informed attacks of Cold War historians who failed to see the temporary and anomalous nature of the major British military commitment in peacetime being an Army and Air Force on the Rhine. When the Cold War ended, Corbett's work was still the only intellectually coherent explanation of why Britain requires a unique, distinctive maritime strategy. British Maritime Doctrine, published as BR 1806 in 1996, and the Strategic Defence Review of 1999 [sic] were Corbettian documents.[29]

Although history cannot predict the future, 'it helps us by providing the evidence from which we develop our own ideas',[30] thus, hopefully, guiding and improving future practice. In this regard, there is much evidence demonstrating the value of a maritime strategy for Britain, and the lessons from where alternatives have not met expectation. Although the future operating environment and international system may be uncertain, the case explaining the role and contribution of maritime power in serving British national policy in the face of myriad challenges is based on a solid foundation.

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[29] Andrew Lambert, 'Sir Julian Corbett and the Naval War Course', in Peter Hore (ed.), *Dreadnought to Daring: 100 Years of Comment, Controversy and Debate in The Naval Review*, (Barnsley: Seaforth, 2012), pp.37-52, quotation, pp.51-52.
[30] Ibid., p.51.

Glossary of Abbreviations

A2/AD	Anti-Access/Area Denial
AAC	Army Air Corps
AAR	Air-to-Air Refuelling
AAW	Anti-Air Warfare
ABO	Access, Basing and Overflight
ACE	Allied Command Europe (NATO)
AEW	Airborne Early Warning
AMRAAM	Advanced Medium Range Air-to-Air Missile
ARRC	Allied Command Europe Rapid Reaction Corps
ASAC	Airborne Surveillance and Control
ASBM	Anti-Ship Ballistic Missile
ASCM	Anti-Ship Cruise Missile
ASTOVL	Advanced Short Take-Off and Vertical Landing
ASW	Anti-Submarine Warfare
ASuW	Anti-Surface Warfare
ATACMS	Army Tactical Missile System
BMD	Ballistic Missile Defence
BROACH	Bomb Royal Ordnance Augmented Charge
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CAH	Helicopter-carrying Heavy Cruiser
CATOBAR	Catapult-Assisted Take-Off But Arrested Recovery
CEC	Cooperative Engagement Capability
CEPP	Carrier Enabled Power Projection

CVF	Carrier Vessel Future (the designator for the Future Aircraft Carrier programme resulting in the *Queen Elizabeth*-class)
CVN	Nuclear-powered Aircraft Carrier
CVNF	'Nuclear-powered Future Aircraft Carrier'
CVS	Anti-Submarine Support Carrier (applied to the *Invincible*-class)
CVSG(R)	Replacement Guided-missile-armed Anti-Submarine Support Carrier (the original lexicon for the projected *Invincible*-class replacement)
CVTOL	Carrier Vessel Take-off and Landing
CVW	Carrier Air Wing
DCDC	Development, Concepts and Doctrine Centre (Ministry of Defence)
DPOC	Deep and Persistent Offensive Capability (post-2005 Tornado replacement)
EMALS	Electro-Magnetic Aircraft Launch System
EMCAT	Electro-Magnetic Catapult
FAA	Fleet Air Arm
FCBA	Future Carrier Borne Aircraft (the Sea Harrier replacement)
FCOC	Future Character of Conflict
FLOC	Future Land Operating Concept
FMOC	Future Maritime Operational Concept
FNOC	Future Navy Operational Concept
FOA	Future Offensive Aircraft (predecessor to FOAS)
FOAS	Future Offensive Air System (the pre-2005 Tornado replacement)
FPDA	Five Powers Defence Arrangement
HCDC	House of Commons Defence Committee

IPPR	Institute of Public Policy Research
ISR	Intelligence, Surveillance and Reconnaissance
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
JAST	Joint Advanced Strike Technology
JCA	Joint Combat Aircraft (succeeded FCBA)
JFH	Joint Force Harrier
JSF	Joint Strike Fighter
LHA	'Landing Ship Assault'; an amphibious assault carrier with the primary role of supporting the air lift of forces ashore (via fixed and rotary wing V/STOL aircraft)
LHD	'Landing Helicopter Dock'; an amphibious assault carrier incorporating a floodable landing dock to support landing and hovercraft for the purpose of amphibious operations in addition to fixed and rotary wing V/STOL aircraft
LitM	Littoral Manoeuvre
LNG	Liquefied Natural Gas
LPH	'Landing Platform Helicopter'; a helicopter carrier (for example, HMS *Ocean*)
MASC	Maritime Airborne Surveillance and Control
MCJO	Maritime Contribution to Joint Operations
MoD	Ministry of Defence
MoD (N)	Ministry of Defence (Navy)
NCADE	Network-Centric Airborne Defense Element
NGS	Naval Gunfire Support
NSS	National Security Strategy (2010)
RAF	Royal Air Force
RFC	Royal Flying Corps

RNAS	Royal Naval Air Service
SDR	Strategic Defence Review (1998)
SDSR	Strategic Defence and Security Review (2010)
SNEB	Airborne 68 mm rocket pod
SRVL	Ship-borne Rolling Vertical Landing
SSBN	Nuclear-powered, ballistic missile-armed submarine
SSGN	Nuclear-powered, guided missile-armed submarine
SSN	Nuclear-powered attack submarie
STOBAR	Short Take-Off But Arrested Recovery
STOVL	Short Take-Off and Vertical Landing
TDCC	Through Deck Command Cruiser (original designation applied to *Invincible*-class)
TIALD	Thermal Imaging Airborne Laser Designator
TLAM	Tomahawk Land Attack Missile
UAS	Unmanned Air System
UCAS	Unmanned Combat Air System
UCAV	Unmanned Combat Air Vehicle
UCLASS	Unmanned Carrier Launched Airborne Surveillance and Strike
USMC	United States Marine Corps
USN	United States Navy
UV	Unmanned Vehicle
VLO	Very Low Observable
VLS	Vertical Launch System
VMF	Versatile Maritime Force
V/STOL	Vertical/Short Take-Off and Landing

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